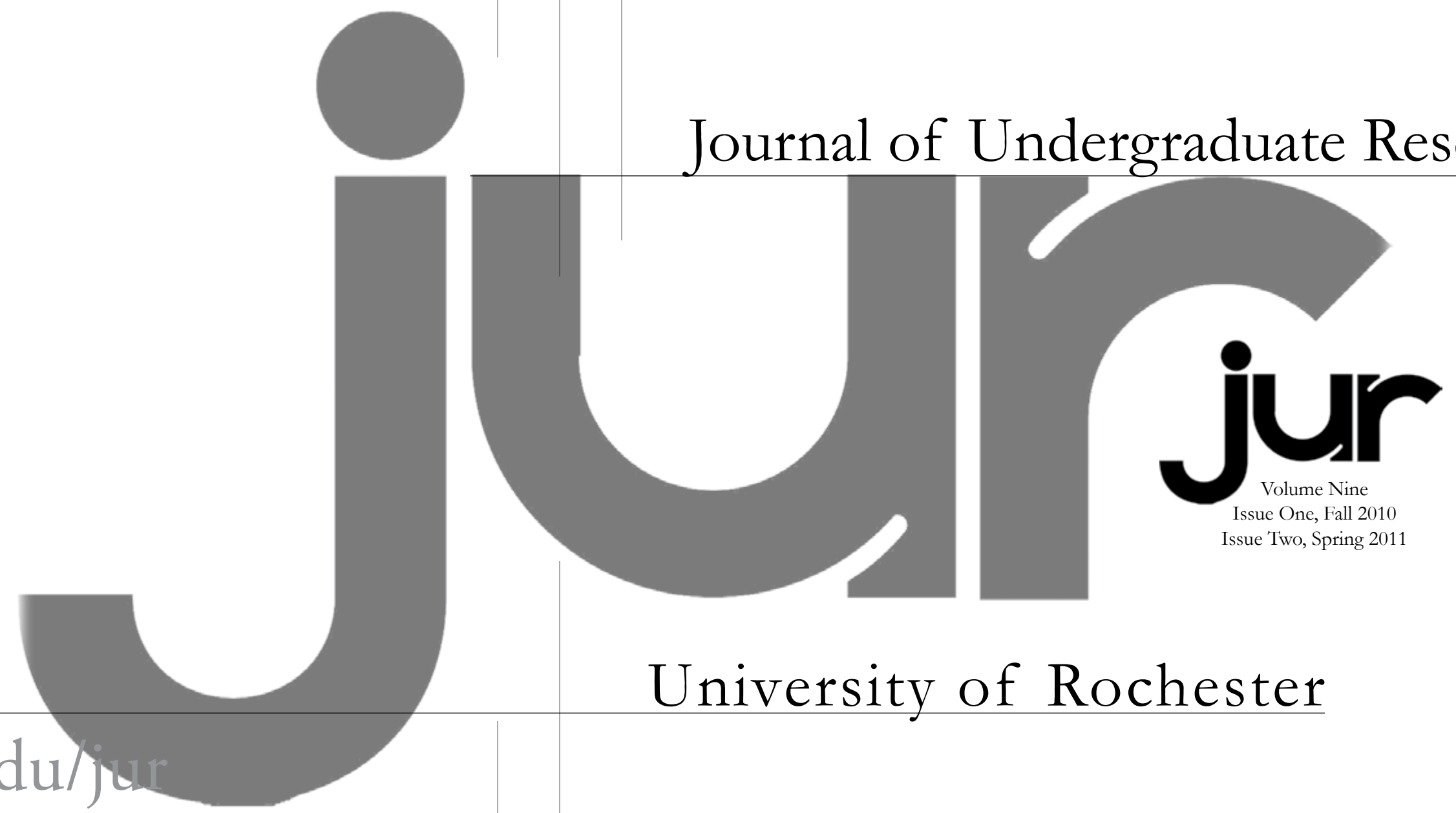# Journal of Undergraduate Research

University of Rochester

sa.rochester.edu/jur

The *Journal of Undergraduate Research (jur)* is dedicated to providing the student body with intellectual perspectives from various academic disciplines. *jur* serves as a forum for the presentation of original research thereby encouraging the pursuit of significant scholarly endeavors.

From the Editors

What do students gain by doing research? More importantly, what do students gain by sharing their research with the public?

The answer to both of those questions is quite simple: by doing research, students gain perspective on the world around them as well as insight into themselves, their abilities, their strengths and their weaknesses. By sharing their research with the public, the authors of the enclosed articles empower their peers not only to do the same, but also to search for what research topics and questions interest our readership.

In this issue, the Journal of Undergraduate Research (JUR) provides original intellectual perspectives from various academic disciples, ranging from physics, to pedagogy, to history. In particular, this issue highlights the many avenues of research available to University of Rochester undergraduates, including independent research, class projects, and senior theses. We thank everyone for their support and collaboration in contributing to the continuing success of this journal. As our mission statement so boldly states, we hope this journal will continue to "serve as a forum for the presentation of original research to encourage the pursuit of significant scholarly endeavors."

Sincerely,

Joome Suh & Olga Karlinskaya

About the Journal

Gerard Markham, 2013

jur: How did you become interested in psychology and how did you become interested in this research?

Gerard : I became interested in psychology during the first semester of my freshman year here. I elected to take a class entitled Theories of Personality and Psychotherapy that was taught by Christopher Niemiec. The material in the class drew me into psychology. A graduate student offered research assistant positions to the class, and (although I was a freshman) I applied by emailing him a resume and going through a formal interview with the graduate student. I had prior research experience at Stanford University with a Professor of Medicine named Professor Marilyn Winkleby. I think some of that experience helped me get the position to work with the graduate student.

jur: What projects are you currently working on?

Gerard: I'm currently working on a number of projects. As third author, I'm working on a project with a graduate student named James Masciale who works with Professor Richard Ryan. The project seeks to apply self determination theory constructs, which aims to explain the deleterious effects of visible support. James and I will be presenting that research in January of 2011, at a professional conference in San Antonio, Texas. I'm also working as a research assistant at the University of Rochester Medical Center. I'm working with professors of psychiatry and psychology Thomas O 'Connor and Emma Robertson- Blackmore. Their research focuses on the implications that prenatal stress and anxiety have on child immune function and temperament as well as cognitive ability. Currently they are having me design my own scale to measure agency in child temperament studies. And lastly, I'm also doing my own research at the medical center that focuses on the relationship between perceived availability of support and stress by measuring salivary cortisol levels, and assessing whether it is moderated by perceived availability of social support. My research is seeking to help clarify 40 years of research on the buffering hypothesis by using psychosocial measures and biological measures rather than just the former. I am assessing whether the results found in previous research are significant enough to carry over to more reliable biological indicators.

jur: What valuable skills do you think you obtained from being involved in research that you would not have been able to acquire in the classroom?

Gerard: First of all, being involved in research gives meaning to the learning you do in the classroom. A lot of the times we learn a bunch of stuff about theories, but we never get to actually apply those things, so they really mean nothing to us. In doing research, you get to see things play out. You get to form your own opinion based on observed results, not because your professors tell you something, but because you found it yourself. You also develop a greater respect for researchers in your field of study because you get introduced to the complexity of designing an experiment. You not only get introduced to conceptual problems but also how to begin solving those problems on your own which can be really hard. I think that the distinct independence of mind that you get from being involved in research is invaluable.

jur: How would you describe the research process of a psychology experiment compared to a natural sciences experiment?

Gerard: It's complex because you're trying to study humans; your research has the possibility of falling victim to everything that the human mind can throw at you, such as self report biases, placebo effects, sampling biases, and unconscious experimenter bias. It truly is hard studying one of the most sophisticated organisms on Earth and in that respect it differs from some of the natural sciences. In physics there are laws; in chemistry there are structures and theories. But a lot of the research that was done 50 years ago about human social interactions, psychosocial effects -what we desire and what motivates us as humans - really isn't that useful now, and the reason for this is that humans change over time and rather quickly. What used to be true about what motivates humans 60 years ago isn't true today because society changes and therefore humans change.

jur: Now just to clarify, do you mean humans changing throughout their lives or humans at different time periods?

Gerard: When we are talking about psychological experiments, we are talking about humans overall, although a lot of the research and theories we have are focused towards certain groups of people. All psychologists understand the fact that, although we would love to make conclusions about the entire population of human beings, there is absolutely no way we will be able to. That means that for our research we have to take reliable samples of the population. Even then we still can't make really accurate conclusions of all of humanity due to the fact that people live in different cultures and in different societies. So if you would want to make a conclusion about a population elsewhere you would have to go to that environment and do the same study.

jur: *Even within societies and subpopulations there can be many differences, correct?*

Gerard: Right, and what we call that in psychology is the variable control problem. If you're doing an experiment to find the boiling point of water, you can literally count the number of variables that you would have to control for in order to find the boiling point. But, let's say you're trying to find out what makes humans mad, or what makes a certain person mad. The variables that you would have to control for are countless. You would have to control for the environment that they grew up in, how they were raised, what motivates them, what do they want as opposed to what they don't want, past experiences and so forth. And so, that's one of the big hurdles in psychology. It's the variable control problem. There are so many variables that need to be controlled for us to come to reliable conclusions.and productive relationship. I probably co-authored five or six (maybe more) pieces with him. And from an early time, I think I was in second year, he helped fund me to go to the various Labor Economics conferences where I would present the work. And I hated it. I hated getting up in front of people. When you're a student, who's not very confident about what you're doing, it's a challenge. [During] my whole entire grad school career, he basically encouraged me to do that.

jur: And it's sometimes impossible to control everything.

Gerard: And that's exactly why psychology is not a soft science!

jur: So what do you plan to do for the future? Do you have other interests in psychology?

Gerard: I plan on going to graduate school for a PhD in clinical psychology, after which I plan on either teaching and doing research at the collegiate level or having my own practice, somewhere in California where it's sunny. My other interest in psychology includes forensic psychology, and area of study that I am almost sure will captivate my mind the more I learn. Some of my other academic interests lie in the study of organizational behavior. Since second semester freshman year I have become interested in learning more about human behavior in the workplace. This area fascinates me so much that I have even entertained the idea of applying to business school in a program for organizational behavior.

jur: What advice would you give fellow undergraduates or freshmen who want to do research but don't know where to start?

Gerard: Those who want to be involved in research should search online for opportunities. One of the best and easiest ways to get involved is to simply ask a professor. Our university prides itself on the idea that it provides countless opportunities for undergraduates to get involved in research. Had it not been for this I probably wouldn't have done research my first semester freshman year. Our career center is also another wonderful place to search for opportunities because it's really easy to set up an appointment to meet with someone about seeking opportunities. Also, one of the really important things to mention is that students should not limit themselves only to professors that are on River Campus. Many students tend to think that the professors that are available to do research are only on River Campus. There are a plethora of professors and researchers that do research at the medical center and need as much help as the professors on River Campus. So if you can't find research opportunities on River Campus, then the next step is to think of doing research with someone at the medical center.

jur: In closing, what are some of the myths about research that you can clear up for people?

Gerard: A lot of people think that you need to know a lot about a specific topic in order to get a research position, and in most cases, this isn't true. Researchers know that everyone involved in research has to have a starting point, and from my experiences, professors don't mind that working in their lab is your first introductory experience. Another thing that I would like to note is that just because you might not be interested in the topic that a professor is researching doesn't mean that you won't like it once you get involved - that's a really big myth. Most people think that if you don't like the topic then you probably shouldn't try researching it. I have many friends around the country that started out researching topics they weren't interested in. Now, they research those same topics in graduate school. You should try to keep an open mind and understand that we, undergraduates, have the tendency to draw conclusions about experiences that we haven't had yet. So we probably shouldn't be narrow-minded when it comes to what we want to research. There is also the myth that research takes a lot of time away from college life.

Modeling of Inflammation of Cerebral Vasculature Caused by MA & HIV

Johnny Ting Zheng, 2012

Adviser: Stewart Dewhurst, Karl Kasischke and Oksana Polesskaya, Ph.D.

Department of Microbiology and Immunology

Methamphetamine (MA) is medically used for the treatment of narcolepsy and mood disorders. Prominent responses induced by MA include arousal, euphoria, accelerated heart rate, elevated blood pressure, increased respiration rate, and increased body temperature.[1] MA has addictive properties, and high doses can cause complications such as anxiety[3], hypertension, appetite suppression, aggressive thoughts, and throbbing headaches.[4] MA can be inhaled, intravenously injected, or smoked. It is the second most popular drug world-wide.[5] MA production and abuse have increased more than 500% during the past decade in the United States.[6]

Previous studies have shown that methamphetamine exposure, especially at high doses, increases the risk of cardiovascular and cerebral vascular diseases such as ischaemic stroke, subarachnoid hemorrhage, intracerebral hemorrhage, and vasculitis.[1,2] There is also evidence supporting neurocognitive impairment and brain abnormalities, including inflammation associated with neurotoxic effect of methamphetamine consumption.[1] A previous study suggested that MA may also contribute to accelerated atherosclerosis which predisposes users to ischemic stroke.[2]

Another possible mechanism of MA-related vascular pathology is that MA damages endothelial cells and disrupts the blood-brain barrier (BBB). Rats that received acute exposure to MA showed morphological abnormalities of cerebral endothelial cells. Bleb formation and perivascular edema was observed on capillary endothelium.[7] The disrupting effect of MA on the functions of the BBB was proved in vitro. The suggested mechanism involved induction of oxidative stress in brain endothelial cells.[8]

In light of this, we first hypothesized that acute exposure to MA causes damage or activation of endothelial cells, which leads to adherence of leukocytes to the endothelium. Tat protein expressed in the brain as a transgene causes inflammation of the brain including edema.[9] We further hypothesized that Tat protein damages endothelial cells and recruits neutrophils to the site of damaged endothelium. Psychological stress or adrenaline infusion causes a significant increase in peripheral circulating leukocytes and the number of activated circulating leukocytes.[10,11] Since MA is sympathomimetic, acute exposure of MA induces a sympathetic-like response. We lastly hypothesized that acute exposure to MA will lead to an increase in numbers of leukocytes in cerebral vasculature.

Based on previous studies that took advantage of intravital microscopy[12,13], we established a model using 2-photon imaging to observe and measure the flow of leukocytes and neutrophils in cerebral vasculature. To validate our model, we used systemic exposure to LPS to induce cerebral inflammation.[14] We then examined leukocyte movement and recruitment in mice that either did or did not express HIV-1 Tat within the CNS, using either GFP-expressing CD18+ cells or Gr-1 labeled neutrophils.

MATERIALS AND METHODS

Animals and dosing

All animals involved were housed with a 12 hour light/dark cycle according to UCAR guidelines. Adult (8-10 week old) C57BL or Tat-tg mice were used.

Mice were anesthetized with an intraperitoneal injection of urethane (1.25 g/kg) and xylazine (2.4 mg/kg). Anesthesia was maintained by injection of a 5-10% of initial dose of urethane (~0.25g/kg) and xylazine (~0.5mg/kg) mixture every 45 min, if necessary. A thin skull cranial window was prepared. Texas Red dye (Dextran, Texas Red, 70,000mw, Invitrogen) diluted in 0.9% saline in the final volume of 200uL was injected intravenously into the femoral vein (17mg/kg). For C57BL mice, 17mg/kg of Texas Red was mixed with 1.7mL/kg of fluorescein-labeled anti-Gr-1 antibody (RM3020, Alexa Fluor® 488) and diluted in 0.9% saline for a final volume of 200uL. Needle (30G1/2) catheters connected to syringes with urethane/xylazine solution and MA solution were implanted intraperitoneally and stabilized. 2mg/kg of lipopolysaccharide (LPS) was intraperitoneally injected to C57BL mice 24 hours before imaging. 1.7mL/kg anti-Gr-1 antibody was used to label neutrophils.

Transgenic mice expressing cyan fluorescent protein (CFP) under control of the CD18 promoter were used to visualize leukocytes. CD18-CFP mice were obtained from Dr. Minsoo Kim and Dr. Youngming Hyun. An acute dose of 5mg/kg MA was injected intraperitoneally during imaging.

For the short binge MA exposure, C57BL mice were intraperitoneally injected with four MA doses of 5mg/kg 1.5 hours apart, with the first dose at 24 hours before imaging. The fifth 5mg/kg dose was injected during imaging. 1.7ml/kg of anti-Gr-1 antibody was used to label neutrophils.

As a model of HIV-1-related brain inflammation, transgenic mice expressing human immunodeficiency virus (HIV) type 1 Tat protein under control of the GFAP promoter (Tat-tg) were used.9 A Tat-tg mouse was intravenously injected with 1.7ml/kg of anti-Gr-1 antibody to label the neutrophils.

Mouse Thin Skull Cranial Window Surgery

To prepare a thin skull cranial window in a mouse skull, the fur at the spot of intended cranial window was shaved. The scalp was cut off, revealing a round-shaped cranial skull. 10% FeCl3 was applied to the skull to remove the tissue covering the skull more easily. A metal bar with a hole for the cranial window was glued to the head of the mouse. The mouse was attached to the holder and its legs were taped to stabilize the body. A lab electrical drill (Drill bit: FST, 19008-07) was used to drill off the glue on the metal bar. A round cranial window of 1.5mm in diameter was thinned using both the drill and norland bendable micro blade (6900, Salvin Dental). The skull was made extremely thin using a drill and fine scratch so that the brain vessels could be observed clearly.

2-Photon Imaging

Laser imaging microscope (Olympus BX 61WI®) was used for imaging. The wavelength was 800nm for CFP/Texas Red or 930nm for fluorescein/Te3xas Red combination. The #6, 460/80, #96, 609/54 and #64, 800/45 filters were used. 4 x and 10 x objectives were used subsequently to find and center field of view on the site of interest under light illumination using software Motic Images®. Then a 25 x objective was used for fluorescent imaging using FluoView10® software.

Line-scan: The movable object stage was adjusted to find the vessels suitable for line-scan. After the desired vessels were located, the "line-scan" function in FV10® was performed. Line-scans were taken on venules and arterioles with diameters <20um because they provide clearer imaging. Line-scan is a function in FV10® in which a single line along the length axis of a blood vessel is scanned repeatedly at high speed. The plasma was fluorescently labeled with Texas Red while the red blood cells were not fluorescent. Thus one shot of a line-scan would show a fluorescent line with several dark dots (red blood cells) on it (Fig. 1). All the scans in a set were displayed from top to bottom with respect to the order of the scan taken. The dark dots would thus combine into stripes on a complete line-scan. Similarly, leukocytes in transgenic mice with CD18 pro motor driven CFP emitted blue fluorescence, displaying blue dots on each line-scan. A complete line-scan contained blue stripes, each reflecting a leukocyte. A line-scan was taken every minute for 30-40 minutes in each experiment. MA was injected 5 minutes after the start of a line scan. A typical result of a line-scan is shown in Fig. 1. The sample picture with stripes has a horizontal axis of position and a vertical axis of time. The flow of red blood cells corresponds to the black stripes in the line-scan. Similarly, leukocytes in CD18-CFP mice were fluorescently labeled and thus would display fluorescent stripes on a line-scan.

To determine the number of leukocytes passing through the vessel, the number of fluorescent stripes on each line-scan was manually counted. The counts were scored from 1-4, 1 being the vaguest and 4 being the most certain. A plot of leukocyte number was generated. A linear regression trend line was calculated to visualize the change in leukocyte number before and after injection of MA.

Z-Stack: Z-stack is a function in FV10® which takes several scans of an adjustable range of depth for a particular region from top to bottom. The images from Z-stack can be combined together to form one picture.[2]
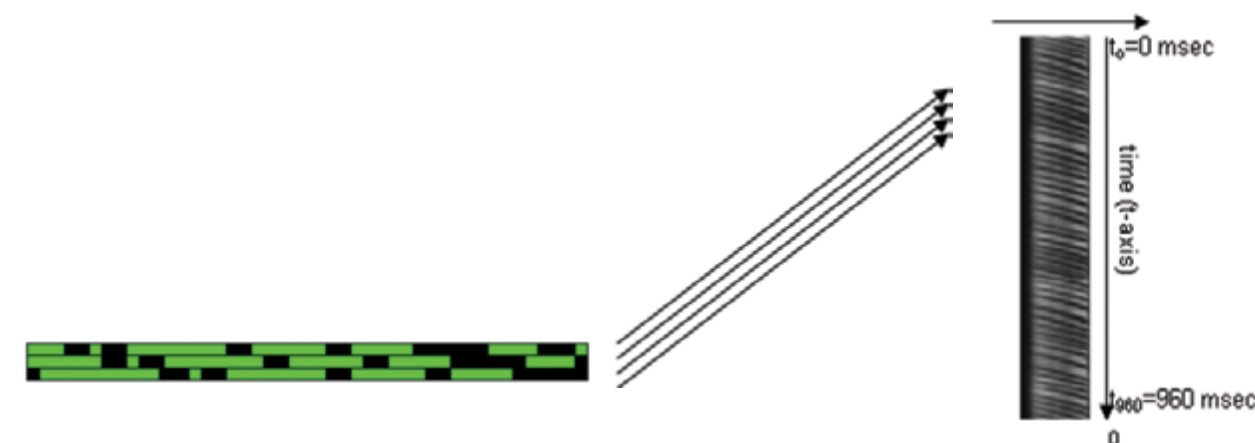
Fig. 1. The green "box" shows the first three linescans out of 960 lines of a complete linescane. A line-scan is an x-t scan, in which a single line along the length axis of a blood vessel is scanned repeatedly (here n=960) at high speed (~1 ms/line). The plasma fluoresces red while red blood cells do not. As shown in Fig.1, red blood cells are seen as dark dots on each line scan and thus form dark stripes once all the line scans are displayed from top to bottom. The horizontal axis indicates position whereas the vertical axis indicates time. The blood cell velocity is calculated using the formula v=1/tan (θ), where θ is the angle formed by the stripes, which was visually measured.
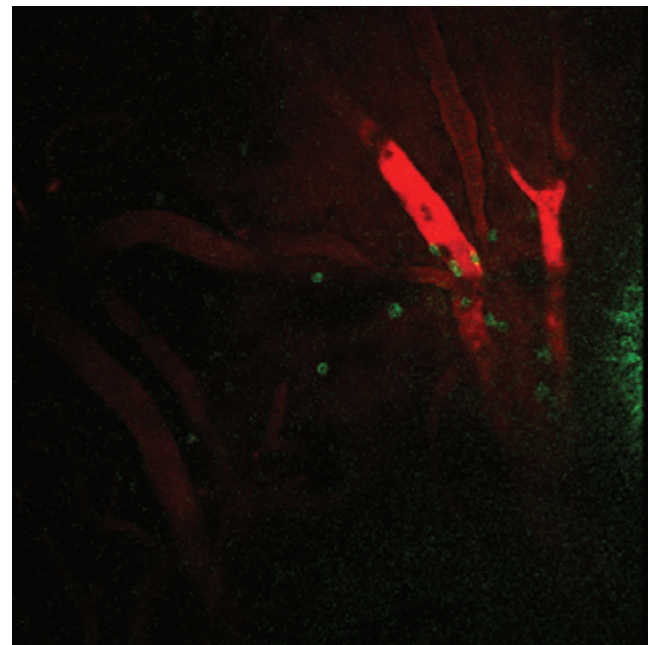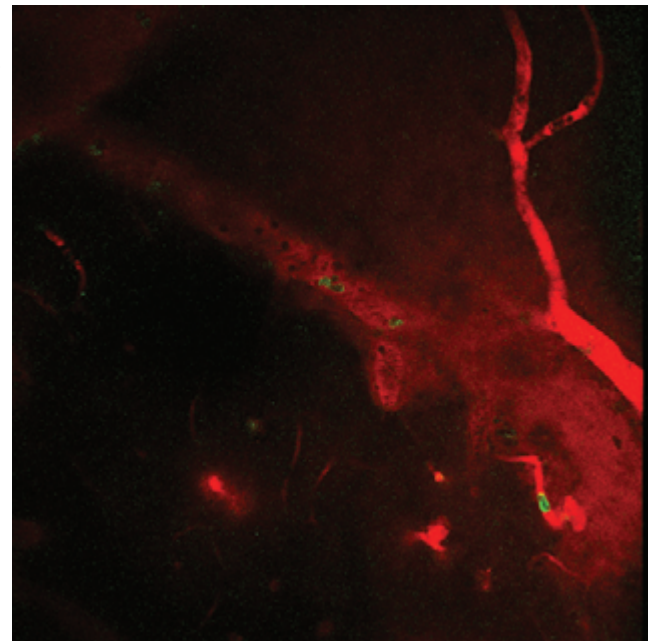
Fig. 2. (A, Top) 2-photon image of C57BL mouse injected with LPS 24 hours before imaging. The blood plasma was labeled red and neutrophils were labeled green. Stationary neutrophils were visualized inside cerebral blood vessels. Fig. 2 (B, Bottom) In the same LPS-injected C57BL mouse shown in (A), some neutrophils were observed in the parenchyma. Some of them were stationary while others were migrating slowly.

RESULTS AND DISCUSSION

LPS causes recruitment of neutrophils into cerebral vasculature

To prove that our model works, we utilized a well established method of recruiting neutrophils to cerebral vasculature. LPS promotes the secretion of pro-inflammatory cytokines in many cell types and leads to immune responses such as recruitment of neutrophils. A C57BL mouse was intraperitoneally injected with 2mg/kg of LPS 24 hours before imaging. The neutrophils were labeled with 1.7ml/kg of Gr-1 fluorescent antibody, which recognizes the expressed product of Ly6g gene. A thin skull cranial window was prepared for imaging. LPS treatment indeed caused recruitment of neutrophils cerebral vasculature. A clear

view of several stationary neutrophils is shown both inside the blood vessels and in parenchyma (Fig. 2A, B).

This result convinced us that we established a suitable model to visualize recruitment of leukocytes in cerebral vasculature. Note that there were dark, circular shapes which were probably cells (Fig. 2A blue arrow) that were not fluorescent. They were probably leukocytes that did not express Ly-6g protein and thus were not bound by anti-Gr-1 antibody. The stationary or slowly migrating neutrophils in parenchyma were probably cells that extravasated from the blood vessels into the parenchyma due to the inflammatory change caused by LPS exposure. Alternatively, LPS-induced leakage of the BBB may have allowed anti-Gr-1 antibody to exit from blood vessels and label cells in parenchyma.

Acute MA exposure did not cause recruitment of neutrophils into cerebral vasculature

To find out if acute MA exposure causes cerebral vascular damage, a C57BL mouse was intraperitoneally injected with four doses of 5mg/kg MA 1.5 hour apart; the first dose was administered 24 hours before imaging. Stationary neutrophils were observed in the parenchyma, but no stationary neutrophils were observed in the blood vessels (Fig. 3). Another boost dose of 5mg/kg was injected during imaging in an attempt to visualize the development of an acute response. The boost dose of MA did not cause a change in neutrophil number. Stationary neutrophils were still only observed in parenchyma but not in blood vessels after the boost dose. Therefore, we conclude that neither short binge, nor acute MA exposure causes neutrophil adherence to cerebral blood vessels.

The number of leukocytes in cerebral blood vessels did not change after acute exposure to MA

Acute exposure to MA causes a sympathetic response in nervous system. The sympathetic response is known to cause an increase of the number of leukocytes in blood.[10,11] The hypothesis of this experiment was that MA exposure might also lead to an increase in leukocyte numbers in blood. To examine this, the number of blue stripes (each representing one CD18+ leukocyte on a line-scan) was manually counted. A scatter plot was generated (Fig. 5). No increase in leukocyte numbers within cerebral blood vessels after acute exposure to MA was evident. We conclude that acute MA exposure does not cause an increase in the number of leukocytes in cerebral blood vessels. This suggests that MA does not lead to an increased number of leukocytes in the blood stream, although additional experiments will be necessary to definitively show this (such as direct counting of leukocytes in peripheral blood samples).

Neutrophils were observed in parenchyma and possibly in blood vessels in Tat-tg transgenic mouse.

To study the mutual influence of MA and HIV-1 Tat protein in cerebral vasculature, a Tat-tg transgenic mouse was imaged (Fig. 6). No stationary neutrophils were observed in blood vessels. Many neutrophils were visible in parenchyma (Fig. 6). However, some neutrophils seemed to be in the process of extravasation as they were surrounding the blood vessels (Fig. 6A arrows). To better observe the neutrophils in parenchyma, we took a Z-stack (Fig. 6B). Many green fluorescent cells were found in
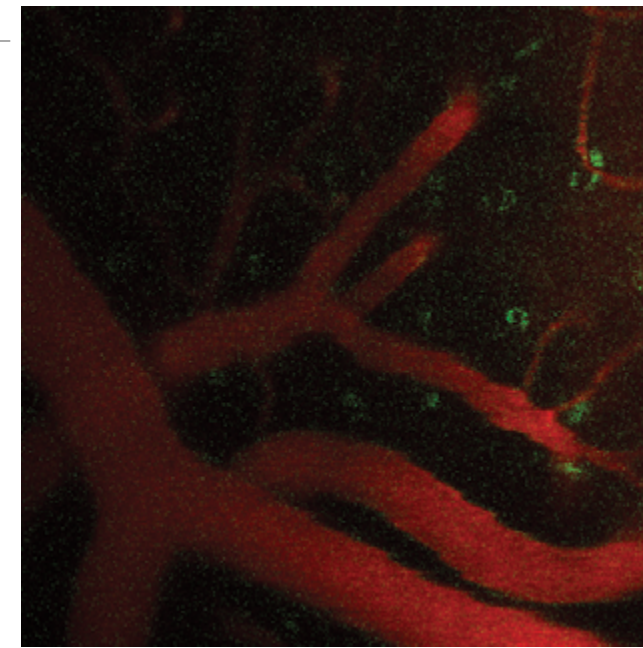
Fig. 3. 2-photon image of acute MA exposed C57BL mouse taken 15 minutes after boost dose of 5mg/kg MA. This mouse was injected with 4 doses of 5mg/kg MA 24 hours before imaging. The blood plasma was labeled red and the neutrophils green. Stationary neutrophils were observed in the parenchyma. No expected stationary neutrophils were observed in blood vessels.
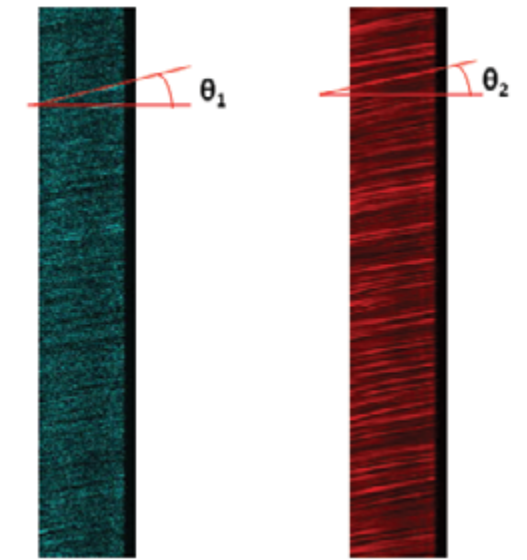
Fig. 4. Example of line scans to measure velocity of red blood cells (red), and CD18-CFP leukocytes (blue). The measured angle θ1 formed by the leukocyte stripes (blue stripes on the left) and the measured angle θ2 formed by the red blood cell stripes (black stripes on the right) were approximately the same. Thus, according to the velocity formula $v=1/\tan(\theta)$, the velocity of leukocyte migration V1 and the velocity of red blood cell flow V2 were very similar.
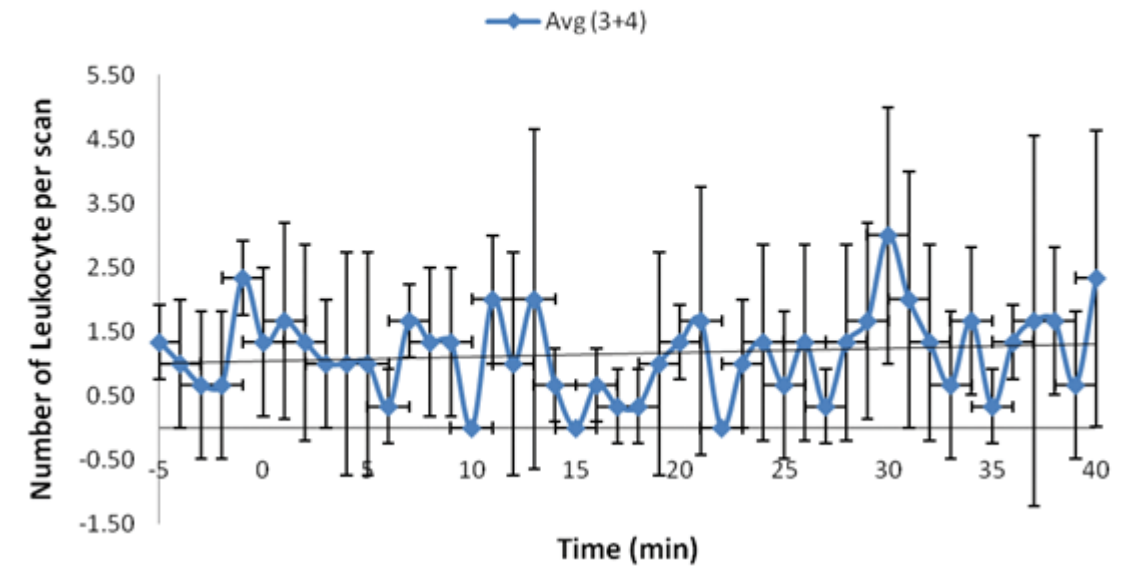
Fig. 5 A scatter plot was generated using the number of leukocytes counted per scan vs. time. The number of leukocytes before and after the injection of MA was scattered and inconsistent resulting in large error bars. A linear trend line was drawn to fit the change in leukocyte number over time.
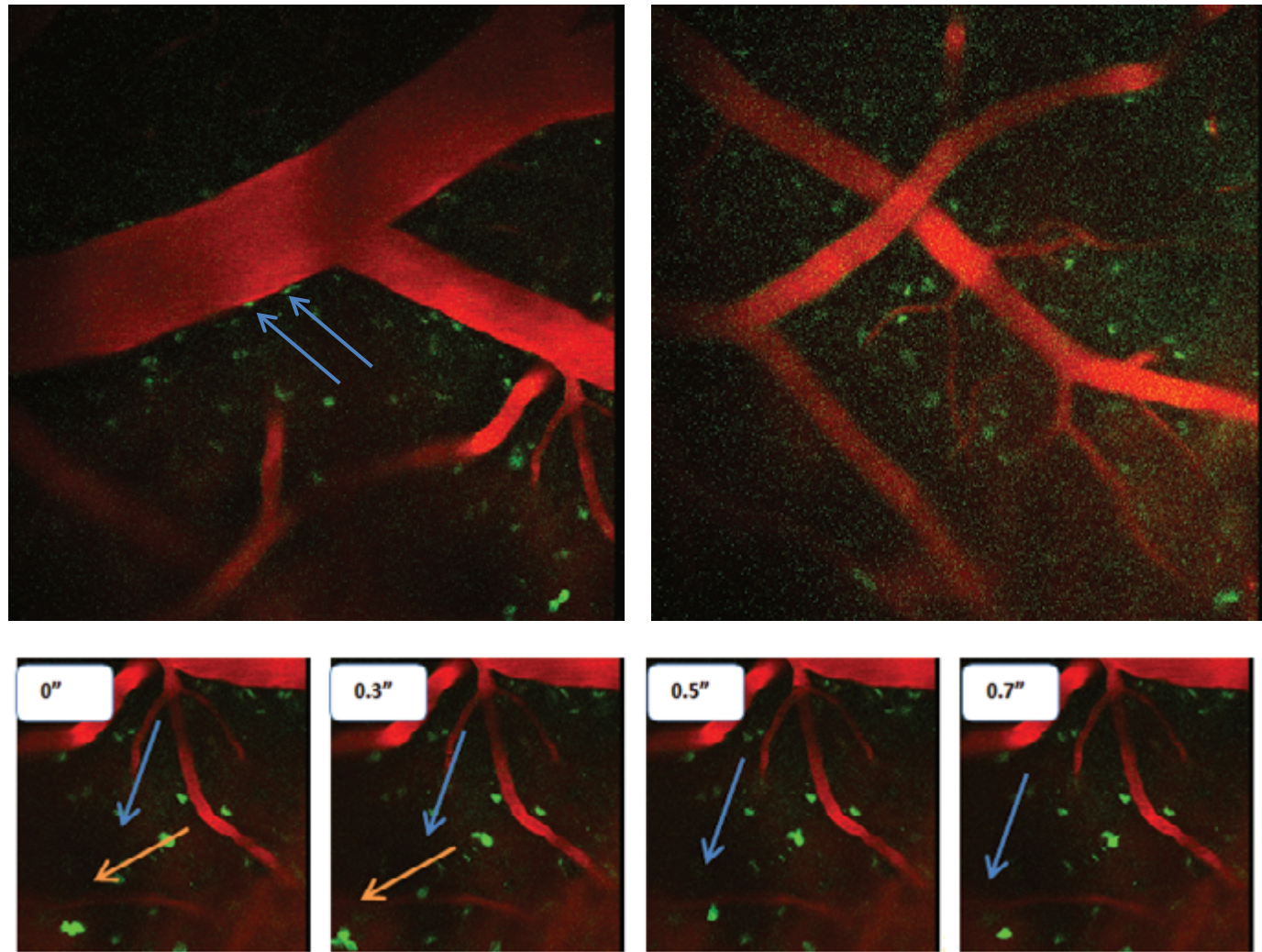
Fig.6. 2-photon image of Tat-tg transgenic mouse. Blood plasma was labeled red and neutrophils were labeled green. Figure 6A (Top left). Neutrophils were observed in parenchyma, which indicates an ongoing inflammation process. Some neutrophils (arrows) were suspected to be at the stage of extravasation as they were surrounding the blood vessels. Figure 6B (Top right). Z-Stack picture, the sum of 5 images taken 0.5um apart as Z-stack. Many green fluorescent cells were observed in parenchyma but no stationary neutrophils were found inside blood vessels. Figure 6C (Bottom). Time-series picture revealed the motion of a few neutrophils. Deduced from the path of motion, these neutrophils might be traveling along or within blood vessels.

parenchyma but no stationary neutrophils were observed inside blood vessels. The intact BBB should not permit diffusion of antibody into brain parenchyma; therefore we did not expect to see labeled cells outside the blood vessels. There are two possible reasons for the presence of labeled cells in parenchyma. First, the neutrophils could extravasate from the blood vessels during the ~ 30 min interval between the injection of anti-Gr-1 antibody and imaging. Second, there could be leakage of anti-Gr-1 antibodies across the BBB due to underlying BBB damage caused by MA treatment, resulting in the appearance of labeled cells in parenchyma of the three mice. Further experiments should be performed to test these two possibilities. To observe the motion of the neutrophils, we performed a time-series imaging. A few neutrophils were found to be moving (Fig. 6C). From the path of motion, we suspected that those neutrophils might be traveling along or within blood vessels, though they were not directly observed to be inside a vessel.

In conclusion, we found that acute exposure to MA does not cause adhesion of leukocytes to cerebral blood vessels or increased recruitment of leukocytes to the CNS either in wild-type mice or in mice that expressed HIV-1 Tat within the CNS. In the Tat transgenic animals, there was evidence of an underlying neuroinflammation, characterized by the possible presence of parenchymal neutrophils; this result is in agreement with previous data which demonstrated inflammation in brain parenchyma of these mice.[9]

CONCLUSION

We have shown that acute exposure to MA does not cause adhesion of leukocytes to cerebral blood vessels or increased recruitment of leukocytes to the CNS in wild-type mice and transgenic mice that express HIV-1 Tat in the CNS.

FUTURE DIRECTIONS

We think that chronic exposure to MA can be detrimental to cerebral vasculature, especially in combination with HIV virotoxins, such as Tat. Therefore future directions include studying the effect of chronic MA treatment on CD18-CFP mice and the effect of combination treatment of HIV virotoxin Tat and chronic MA in Tat-tg mice.

From the current work it is not clear whether the Gr-1-positive cells in the parenchyma of Tat-tg mice are indeed neutrophils, because neutrophils should not be present in the brain parenchyma. To test this, we could inject purified pre-labeled neutrophils and compare their distribution with the results obtained when the anti-Gr-1 antibody is infused directly via the IV route. We could also perform peroxidase staining on brain tissue sections to identify neutrophils and compare results with Gr-1 staining (peroxidase and anti-Gr-1 should label the same cells).

Finally, to determine BBB integrity in Tat-tg mice, we could infuse antibodies against neurons or astrocytes and test whether the IV-infused antibodies label cells in brain parenchyma of Tat-tg or MA-treated mice. The intact BBB should prevent antibody penetration from the blood vessels. An alternative approach would be to inject fluorescent microparticles into Tat-tg or MA-treated mice and test whether MA changes BBB permeability in vivo by examining the distribution of these particles.

REFERENCES

1. Cruickshank, C.C. and K.R. Dyer, A review of the clinical pharmacology of methamphetamine. Addiction, 2009. 104(7): p. 1085-99.
2. Ho, E.L., et al., Cerebrovascular complications of methamphetamine abuse. Neurocrit Care, 2009. 10(3): p. 295-305.
3. Martin W. R., S.J.W., Sapira J. D., Jasinski D. R., Physiologic, subjective, and behavioral effects of amphetamine, methamphetamine, ephedrine, phenmetrazine, and methylphenidate in man. . Clin Pharmacol Ther 1971. 12: p. 245-258.
4. Bell, D.S., The experimental reproduction of amphetamine psychosis. Arch Gen Psychiatry 1973. 29: p. 35-40.
5. Crime, U.N.O.o.D.a., World Drug Report. Vienna, Austria: United Nations Office on Drugs and Crime, 2007.
6. Substance Abuse and Mental Health Services Administration, O.o.A.s., The DASIS Report: Primary Methamphetamine/Amphetamine Treatment Admissions: 1992-2002. 2004.
7. Sharma, H.S. and E.A. Kiyatkin, Rapid morphological brain abnormalities during acute methamphetamine intoxication in the rat: an experimental study using light and electron microscopy. J Chem Neuroanat, 2009. 37(1): p. 18-32.
8. Ramirez, S.H., et al., Methamphetamine disrupts blood-brain barrier function by induction of oxidative stress in brain endothelial cells. J Cereb Blood Flow Metab, 2009. 29(12): p. 1933-45.
9. Kim, B.O., et al., Neuropathologies in transgenic mice expressing human immunodeficiency virus type 1 Tat protein under the regulation of the astrocyte-specific glial fibrillary acidic protein promoter and doxycycline. Am J Pathol, 2003. 162(5): p. 1693-707.
10. Mian, R., et al., Observing a fictitious stressful event: haematological changes, including circulating leukocyte activation. Stress, 2003. 6(1): p. 41-7.
11. Sondergaard, S.R., et al., Adrenaline-induced mobilization of T cells in HIV-infected patients. Clin Exp Immunol, 2000. 119(1): p. 115-22.
12. Atkinson, S.J., Functional intravital imaging of leukocytes in animal models of renal injury. Nephron Physiol, 2006. 103(2): p. p86-90.
13. Halin, C., et al., In vivo imaging of lymphocyte trafficking. Annu Rev Cell Dev Biol, 2005. 21: p. 581-603.
14. Rummel, C., et al., Leptin regulates leukocyte recruitment into the brain following systemic LPS-induced inflammation. Mol Psychiatry, 2010. 15(5): p. 523-34.

Israeli Policy and the Israeli-Armenian Minority:
A Study of Realpolitik, Cultural Bias, and National Hypocrisy

Juliet Miriam Berman, 2011
Adviser: G. Bingham Powell, Ph.D
Department of Political Science

I srael's political system serves as a unique example of a democratic pluralist society. Recently, the extensive integration of economies, societies, and cultures has resulted in substantive improvements in international relations. However, this globalization has considerably altered the sociopolitical landscape and has remained a continuing issue in Israel's political system. With an increase in the immigration of various minorities, cross-cultural contacts have become more common and accepted. The major transfer of large refugee populations over the decades has also facilitated the spread and amplified the influence of multi-culturalism. As a result, Israel has had to manage these "imported" cultures in an attempt to unify their populations and their political systems and to promote peace among their various ethnic groups.

The Armenians are a small minority population in Israel and their political role within Israeli society is of particular interest. In total, there are an estimated 3,000 Armenians who are Israeli citizens and 4,000 more who have Jordanian citizenship (residing in Jerusalem or in the West Bank)[1]. Historically, there has been an Armenian presence in Israel for over two millennia. The Armenian Quarter in Jerusalem has served as the community base, forming "a homogeneous entity housing a self-sustained community with its churches, schools, public and social institutions, residences and historical monuments." [2] At its peak, the Armenian population in Jerusalem numbered more than 16,000. However, the 1948 Arab-Israeli civil war resulted in major population shifts and dispersal for all minorities, including Arabs, Druze, Bedouin, and Armenians. The overall chaos and peril of war, as well as specific fear of persecution, evidently led to such an exodus. Nonetheless, the Armenian population, while small in size, maintained an impressive presence. With significant historic and religious roots based in Jerusalem, donations and funding from pilgrims, the Armenian Catholic Archdiocese, and Diaspora benefactors have supported this base.[3] The Armenians are just one example of the various ethnic groups which have greatly influenced the socio-political landscape, with a clear and unwavering presence despite decades of war.

Although Israel is considered a developed nation with Western values and democratic political institutions, its political system appears to be increasingly volatile and significantly stressed by the conflicting cultures it governs. Israel's attempt to balance its various ethnic, religious, and political influences illustrates the difficulty in harmonizing various minorities with the radically different Jewish-Israeli culture. The treatment of the Armenians is generally representative of Israeli policies regarding all minorities. There are many social factors inhibiting the success of a complete synthesis of these various cultures. The Jewish-Israeli identity is central to society; eventually, if the ethnic conflicts were resolved with completely integrated minorities and a unified political system, the minority populations could become the majority, thus destroying Israel's Judeo-centric identity. Strong influence from ultra-religious political parties renders Israeli policy intolerant of this possibility. Of course, the small Armenian population would appear to pose no threat to this Jewish identity. Furthermore, the comparable histories of persecution and genocide shared between the Jewish and Armenian people would suggest that a policy of tolerance and empathy should prevail.

Security factors must also be considered. Domestic terrorism and regional threats play a significant role in defining Israel's political system. Consequently, it appears that the treatment of minorities is substandard and unequal in order to maintain a Jewish majority and to diminish security threats. In particular, relations with Turkey prove to be essential in maintaining stability in the Middle East. As a result, Armenian civil rights are compromised in order to placate the Turkish government. However, Israel's democratic principles and government institutions lead one to expect excellent treatment of such minorities. At the same time, the continuing security threat suggests that individual rights are more likely to be suppressed by the political system.

Israel's domestic agenda and foreign affairs, influenced by such sociopolitical factors, are subject to both of these theories, with the Armenian population serving as an instructive example. The question arises: What are the actual effects on Israeli policy and on Israel's Armenian population, given the complexity and contradictions of specific domestic and international influences?

The Jewish-Israeli Identity in Creating the Sociopolitical ATTITUDE

From the very founding of Israel in 1948, Jewish foreign policy was of utmost importance, radically shaping the political system. The Holocaust was such a traumatic element in Jewish society and culture that its influence has naturally been pervasive. Israel in its early years established a number of principles, including an open immigration policy, responsibility for the security and well-being of Jewish communities worldwide, undertaking the rescue of distressed Jews from foreign countries, and attempting to capture Nazi war-criminals. All of these policies were designed to ensure a continuous struggle against anti-Semitism and to refute the Holocaust deniers. Overall, Israel as a Jewish state has emerged from the ruins of the Holocaust, using this recent history (as well as the events and inspiration of the preceding 3,000 years) to build a nation. As a result, a distinct Jewish-Israeli identity has been developed – an identity that attempts to achieve equilibrium within the constraints of a democratic, yet non-secular, regime.

While the Jewish Holocaust is the most well-known genocide, the Armenian slaughter is considered by most historians to be one of the first modern genocides. With such a comparable past shared between the Jews and the Armenians, there should be a strong sense of solidarity and kinship between the two groups of people. In fact, there is primarily one demand that the Armenian population has consistently made to the Israeli government – official recognition of the Armenian Genocide. Yet Israel has consistently refused to acknowledge the Armenian Genocide, claiming that "historians, not politicians, should discuss the issue."[4] The suggestion that genocide should be reserved strictly for historians is hypocritical relative to Israel's intense response to the Jewish genocide – the Holocaust directly and pervasively influences Israeli policies.

The education policy in Israel mandates a specific curriculum in the teaching of the Holocaust, promoting a "hegemonic version of Holocaust memories, [becoming] the central educative apparatus."[5] A cohesive historical memory is vital in creating a Jewish-Israeli ethnocentric identity – a unifying factor in the Jewish majority. While the memory of the Holocaust is central to this Israeli collective identity, "the formal curriculum is accompanied by stressing the linkage between the Holocaust, the existence and the moral justification of Zionism, and the State of Israel."[4] The recognition of the Armenian Genocide is seen as a direct threat to this collective identity, with the fear that it could diminish the significance of the Jewish Holocaust. The ultra-Orthodox community especially is a great denier of the Armenian Genocide, as there seems to be a "competition of victims."[4] Consequently, several very influential and conservative Jewish-Israeli groups lobby to actively oppose recognition.

Israel also claims that fear for the safety of Turkish Jews as well as for Jews in other Arab nations motivates the evasive Israeli position regarding the Armenian genocide. The Turkish government adamantly denies any involvement in the carnage, claiming that any documented Armenian deaths were the result of war, not specific ethnic persecution. If Israel were to anger Turkey by such recognition, there could be anti-Semitic repercussions throughout the Arab world. Protection of Jews worldwide has been a central theme of Israeli foreign policy since the foundation of the state. This principle suggests that Israel is willing to compromise its democratic system to preserve this aspect of Jewish-foreign policy and to protect the "uniqueness" of the Jewish Holocaust – two themes central in defining Israeli sociopolitical attitudes.

The blatant denial of recognition for the Armenian victims is readily apparent in Israel's domestic policy. The Knesset has consistently rejected bills that recognize the Armenian genocide. This issue has been introduced in the Knesset several times (with persistent opposition from some members of parliament); all of the bills have subsequently failed to pass. In response to the most recent Armenian genocide recognition bill of 2007, a Member of Parliament (MP) of the Meretz party strongly condemned denial of the genocide not only for moral reasons, but also because of strong Jewish empathy. The MP proclaimed that the Israeli government "[owes] this vote not only to the Armenian people, we owe it to ourselves, especially in a period where we are struggling to prolong the memory" of the Nazi Holocaust."[5] Nevertheless, the significance of the Jewish-Israeli sociopolitical attitude outweighed the immoral implications of implicitly denying the Armenian Genocide.

Further, by disregarding memorial assemblies held every year on April 24th by Israeli-Armenians, the Israeli government systematically avoids this issue. Government officials have never participated in such assemblies, apart from two exceptions. Israel has also controlled and pressured its own media. Specifically, in 1978 Israeli authorities demanded that the Israeli Broadcasting Authority (IBA) cancel presentation of a film about the Armenian Quarter in Jerusalem, which had several references to the genocide.[7] Again in 1990, the IBA canceled another movie screening; the American film, "Journey to Armenia" also referenced this genocide, and so it too was cancelled. The IBA managing director did not even attempt to discreetly specify the reasons for cancellation, admitting that "they had received request from the Chief Rabbinate of Turkish Jewry, from the Association of Turkish Immigrants in Israel, and from other Turkish-Israeli immigrant groups."[6] This direct manipulation and interference of the media is an egregious violation of a democratic system and principles.

There are various causal mechanisms which should protect minority rights in a democracy, regardless of the sociopolitical factors. Across government, there is a strong positive correlation between economic prosperity and the degree of democracy within a regime – economic development encourages citizens to be more active in politics through media, education, and various institutions. Consequently, mobilization and coordination of activities is strengthened, and thus higher levels of participation are evident. The creation of a strong civil society also derives from the diversity and density of the population. These factors spawn more interest groups and policymaking, which serve to promote accountability and equality within society. All of these influences work to protect minority rights and civil liberties. However, Israel is a unique system which does not fit traditional models of democracy. Lijphart's consensus model of democracy most closely fits the Israeli system. The method of proportional election, with formation of coalitions in a multi-party system, maximizes the representation of citizens.[8] There are also organized corporatist interest groups which help promote the inclusion of minorities. It would seem evident that these institutions would mitigate the effects of a sociopolitical culture. However, there is no written constitution, and to date no minority party has served in any government coalition.[9] An emphasis on consensus within a democratic system typically serves to promote inclusion. Yet, the Israeli government's agenda maintains the specific goals of catering to the Jewish majority.

ISRAEL-TURKEY RELATIONS AND THE SECURITY IMPLICATIONS

The Armenian minority in Israel is extremely underrepresented in politics, yet this group poses no apparent security threat. Turkey firmly denies the Armenian Genocide, and the different Turkish governments have exerted a consistent pressure on other nations, including Israel, to do the same. The pressure on Israel began when the nation was founded and is a continuing aspect of Turkish foreign relations. At Turkey's urging, Israel has altered its domestic and foreign policies, using its own political influence to perpetuate Turkish denial in the international realm. Nevertheless, there has been an outcry from the worldwide Jewish community, condemning the denial and the Israeli government's submission to Turkish pressure. Despite this resistance, and, although the official Israeli position concedes that what happened to the Armenians was a "tragedy," Israel continues to avoid the term "genocide." In order to placate the Turkish government, which is resolute in denying its involvement in the Armenian genocide, Israel is apparently willing to promulgate what is at best a historical misrepresentation.

The Holocaust resonates so deeply in the minds of every Jew worldwide, that it would seem impossible that a Jewish state could actively choose to ignore the Armenian genocide, regardless of the potentially negative impact on Israel's relationship with Turkey. While Israel's relationship with Turkey is clearly a very strategic partnership for security and economic reasons, perpetuating Armenian Genocide denial is inexcusable. Such recognition of the genocide would be symbolic in nature, having no tangible effect on Turkey. As a democracy, Israel's regime should be antithetical to such mistreatment of a minority group for a seemingly symbolic cause. Consequently, the question arises: how can potential benefits with Turkey be so influential that they can induce Israel's political system, immorally and hypocritically, to ignore the demands of its own Armenian citizens?

In 1948, Israel emerged from the War of Independence as the victor, with an internationally recognized state and military success against the invading Arab neighbors. However, this significant success was diminished by the many problems Israel faced. With heavy military losses, almost no infrastructure, and a tenuous regional security, Israel was very vulnerable, and its main focus was survival. While military development became the highest priority for Israel, strong foreign relations were also essential – for without foreign support, Israel had no way of acquiring arms to expand its military.[10] Since Israel's establishment in 1948, Turkey has recognized the Jewish state, with diplomatic relations starting almost immediately. This partnership has proved to be strategically important because of the diplomatic, economic, and military ties. Turkey is the strongest and most influential Muslim nation in the Middle East, and Israel is not readily willing to compromise this friendship.

Diplomatically, Turkey has engaged with Israel since its declaration as a state in 1948. The establishment of diplomatic relations sent a strong message to the other Arab nations. While these formal ties were mostly symbolic until the 1990s, they were pertinent to Israel's position in the Middle East. As Israel developed and strengthened as a nation in its early years, Turkey's support served to validate Israel's existence and position in the international realm; such recognition from a Muslim state created the impression that Israel was a legitimate and viable nation that other Arab nations would have to accept. Throughout history, social, political, and economic volatility has been rampant in the Middle East, yet Turkey has remained "relatively stable, pro-Western, and prosperous over the entire span of Israel's existence."[11] With security as a main goal for Israel, the constancy and character of Turkish politics prove to be essential in maintaining a stable environment. In particular, Turkey's commitment to secularism serves as an anchor of stability, and Israel is more than willing to compromise the Armenian minority to sustain this beneficial relationship.

Despite the history of official diplomatic ties, Israel-Turkey relations had no tangible results until the 1990s, after which this relationship provided additional benefits to Israel. Security is a common goal for both nations; this "strategic partnership is partly grounded in similar perceptions of regional threats, in particular the threats of extremism and terrorism."[12] As a Muslim state, Turkey is able to exert a substantive influence on its Arab neighbors which threaten Israel and on the overall stability of the Middle Eastern region. In addition, Turkey's secular nature provides the unique ability to be an objective contributor to the peace process. From the onset, Israel recognized Turkey's potential as a key mediator in negotiating peace, hoping that "ties with Turkey would dilute the religious element of the Arab-Israeli conflict."[10] This potential is realized even in the most current political situations – Turkey clearly demonstrated a "constructive bridging role" when it mediated indirect talks between Israel and Syria in 2009. This regional "activism" is a continuing characteristic of Turkey's foreign policy, which Israel fully appreciates.[11]

Economically, Israel and Turkey have a very strong mutual dependence. For Israel, water is a major source of contention, and Turkey can provide relief due to its abundance of natural water resources. Water is scarce in the Middle East, and consequently it has become a tool of political power – an instrument for cooperation, essential for promoting both Palestinian and Israeli agriculture.[13] While various water and resource summits have occurred in the past, Turkey and Israel have only now started serious negotiations for the transportation of not only water, but also electricity, natural gas, and oil by pipelines to Israel.[14] In 2001, a water agreement was finally reached, for the purchase of 50 million cubic meters of water per year (over a ten-year period). Though Israel prefers not to rely on foreign sources for water, such dependence will only strengthen overall trust and relations with Turkey.

Throughout the past decades, Israel and Turkey have mutually transacted a very large volume of business, promoting economic growth in both nations. With a bilateral Free Trade Agreement fully operational by the year 2000, financial ties continued to strengthen. Specifically, in February of 2000, Israeli companies were contracted for work in Turkey for development projects (e.g., dams, hydro-electric plants, and irrigation systems) and the total value of these contracts grossed $600m.[15] In addition, the overall annual trade volume for Israel is $1.5 billion in exports and more than $1 billion in imports, to and from Turkey.[16] It is obvious then, that a change in diplomatic relations could have serious implications for the economic well-being of Israel. Nevertheless, this bilateral trade is only a fraction of Israel's and Turkey's total foreign trade, with export to larger markets serving as the primary means of economic growth.

Military cooperation with Turkey functions as both an economic and defensive opportunity for Israel. The economic aspect is obvious. With liberal sharing of military systems and technology, the resulting revenue has generated hundreds of millions of dollars for Israel. A financial advantage of significant military ties with Turkey is evident in arms sales alone. Israel has been successful in the direct sales of arms to Turkey because of the high quality and reliability of Israeli armaments; a consequence of this success is to further secure Israel's share of the military market. Of course, specific Israeli military contracts have also generated enormous revenue: $63 million for upgrading Turkish aircraft, $150 million for joint production of air-to-ground missiles, $200 million in the production of Popeye II missiles, $900 million for modernizing battle tanks, etc.[17] These examples are just a representative sample of the various military contracts Israel has had with Turkey. The amount of profit gained is enormous, reaching into the billions of dollars throughout the decades.

The military connection with Turkey also helps Israel to augment its security. In 1992, a document for military collaboration was signed, developing a "concrete protocol… designating specific areas of military co-operation."[16] Both the Israeli and Turkish Air Forces were then able to train together. With open airspace and exposure to new terrain, the Israeli military gained significant experience, thus increasing its military strength. Intelligence ties were also strengthened in the 1993 Memorandum of Understanding, providing Israel with additional military information regarding Syria, Iran, and Iraq.[16] While this military cooperation is a fundamental part of Turkish-Israeli relationships today, developing security ties with "the strong, stable, and pro-Western peripheral states surrounding the Arab world"[2] has been an Israeli goal since the 1950s. Efforts to establish relations specifically with Turkey were not a new concept – military development was the main focus of policy from Israel's inception, and regional security connections were the ultimate goal. For decades, Iran and Ethiopia also played a role in securing the Middle East, yet in the 1970s, with the Islamic Revolution in Iran and the Marxist takeover in Ethiopia, the mantle of leadership in regional security was placed firmly on Turkey.

CONCLUSION

The various diplomatic, economic, and military ties between Israel and Turkey are based on mutual interest. Given the current potential for political and military volatility in the Middle East, it is exceedingly apparent that maintaining good relations with Turkey is imperative for Israel. Any change in diplomatic standing could have severe consequences, affecting all aspects of Israeli life. However, while there have always been relations with Turkey since Israel's creation, this partnership was not so advantageous or vital until the 1990s. A refusal to explicitly acknowledge the Armenian Genocide has been Israel's consistent policy. Although Israel did not always have a strong partnership with Turkey, Israel has always been willing to defer to the Turkish view of the Armenian Genocide. For many years, Turkey was the only Muslim nation willing to offer Israel formal recognition and mutual relations. To maintain the strength of this relationship, Israel sought to placate the Turkish government. The security and economic relations prove to be exceedingly significant to Israel's political system.

The import of the Turkish-Israeli relationship and the constant security threat that Israel faces certainly explain the mistreatment of the Armenian minority, regardless of the fact that Israel is a strong democratic society. Despite the prevailing political and cultural forces, the Armenian minority is able to maintain basic rights within this political system, even though they struggle to gain significant control and political representation.

Israel is a strong, democratic regime, so the question arises as to why significant inequities exist for the Armenian population. While the Armenians take a relatively passive stance in their role in government, Israel's minority policies in many cases seem to be ill conceived, prohibiting any real influence of the Armenian population. Israel is in a constant state of alert, and as a result, military considerations are a key element in Israeli policy; the relationship with Turkey is considered to be the cornerstone of regional stability. With such turmoil in the Middle East, it is to be expected that citizens may lose individual rights in a nation in a constant state of alert. However, Armenians seem to consistently experience inequality, regardless of the changing levels of the security threat over the decades. While one theory expects minority populations to be well treated in a democratic regime, the other theory maintains that security threats can constrain the civil rights of the population. Nonetheless, there seem to be other variables which serve as causal mechanisms for mistreatment of the Armenian population. The strong Jewish-Israeli identity can certainly explain Israel's extreme reluctance to integrate other ethnic groups fully into society. This sociopolitical factor skews the results of the anticipated theoretical outcome, while subjecting Israel to the strong effects of the two conflicting theories.

REFERENCES

1. Armenian Diaspora "Armenian Populations of the World." http://www.armeniadiaspora.com/population.htm
2. Jewish Virtual Library. "The Armenian Quarter." http://www.jewishvirtuallibrary.org/jsource/Society_&_Culture/geo/armenianq.html
3. Tutunjian, Jirair. "Armenian Church in Jerusalem Caught in Palestinian-Israeli Conflict." http://www.keghart.com/node/341
4. Harkabi, Y. Palestinians and Israel. Jerusalem, IL: Keter House, 1974.
5. Auron, Yair. The Banality of Denial. Transaction Publishers. p. 106. (2003).
6. "Israel Parliament Rejects Armenian Recognition Bill". Agence France Presse. (March 2007)
http://www.aztagdaily.com/EnglishSupplement/NEWS_03152007_0001.htm
7. Auron, Yair. The Banality of Indifference. Transaction Publishers. (2000). p. 352
8. Lijphart, Arend, Patterns of Democracy. Yale University Press. (1999).
9. "Israel Political System and Party Definition." http://www.zionism-israel.com/dic/politicalsystem.htm
10. Ibid 5.
11. Middle East Quarterly. "Formula for Stability: Turkey plus Israel." Vol. 9. Num. 4. (Fall 2002).
12. Britain-Israel Communications Research Centre. "Obama's visit to Turkey and its Strategic Significance for Israel." (06.04.2009) http://www.bicom.org.uk/newsletter-latest-from-bicom/bicom-analysis--obama-s-visit-to-turkey-and-its-strategic-significance-for-israel
13. Muftuler-Bac, Meltem. Policy Papers. "Turkey and Israel: An evolving Partnership." (1998).
14. Lefkovits, Etgar. Jerusalem Post. "Israel and Turkey Plan Energy Pipeline." (May 11, 2006).
15. Athanassopoulou, Ekavi. Gitleson Peace Publication. "Israeli-Turkish Security Ties: Regional Reactions." (March 2001).
16. Bar'el, Zvi. Ha'aretz Newspaper. "Why we Need Turkey." (Feb. 2009).
17. Efraim, Inbar. BESA. "The Israeli-Turkish Strategic Partnership." Num. 53. p. 171. (2003).

Antifungal Activity of Tamoxifen and its Analogs Against the Opportunistic Pathogen, *Candida albicans*

Julie M. Tabroff, Louis P. DiDone, Kristy Koselny

Advisers: Melanie Wellington, M.D., Ph.D. & Damian J. Krysan, M.D., Ph.D.

Departments of Biochemistry, Pediatrics, and Microbiology & Immunology

C*andida albicans* is the fourth major cause of bloodstream infections and is the leading cause of invasive fungal infections in immunocompromised patients[21]. The mortality rate for *C. albicans* infections is as high as 20-35% [3, 5, 12]. Candidemia causes an increase in morbidity and mortality, as well as increases in length of hospital stay, which leads to an increased cost of care. Unfortunately, the treatment options for life-threatening fungal infections are limited, especially when compared to those available for bacterial infections. Antifungal drug development is urgently needed in order to prevent and treat these invasive fungal infections.

In addition to the pressing issue of developing new therapeutic treatments for invasive fungal infections, there are complications to their development. Since fungi, like human cells, are eukaryotic, many biochemical and cellular processes are conserved between fungi and humans. This presents difficulties in developing treatments that specifically target fungi without harming the patient. One approach to accelerate the process of antifungal drug development is to identify and explore the efficacy of drugs currently in use for other purposes. In a recent screen of a library of FDA-approved drugs, we identified a set of calmodulin inhibitors, including the estrogen receptor antagonist tamoxifen (TAM), that have direct antifungal activity[7]. Although the antifungal activity of TAM had been previously described in S. cerevisiae and C. albicans, its in vitro activity had never been fully characterized prior to work in our laboratory[1, 20].

In a recent publication from our lab, we showed that TAM and its analog clomiphene have good in vitro activity toward pathogenic yeasts (Candida species and Cryptococcus neoformans) and display in vivo activity toward *C. albicans*. Mechanistic studies in S. cerevisiae strongly suggest that TAM targets calmodulin (CaM) as part of its antifungal mode of action. CaM is a small calcium binding protein that functions by binding and activating many downstream effectors . The binding to downstream partners can happen in a calcium-dependent or calcium-independent manner. In fungi, CaM plays an important role in several critical cellular processes such as mitosis, protein trafficking, exocytosis, cytoskeletal structure and polarized growth [[6]. Accordingly, TAM was shown to inhibit new bud formation, disrupt actin polarization, and block CaM from binding to its target protein Myo2 in S. cerevisiae.

In most eukaryotes, CaM genes are >95% conserved between species. However, yeast calmodulin genes are only 70% identical and lack one of the 4 Ef-hand binding domains found in human calmodulin. These structural differences may explain why TAM levels sufficient to kill yeast are tolerated in humans. This fact also suggests that other CaM targeting molecules may be attractive antifungal drugs.

Two cellular processes that are CaM dependent in fungi are hyphae formation and cell wall biosynthesis. Both of these processes are relevant to antifungal therapy because the ability of *C. albicans* to form hyphae is required for virulence and the cell wall is required for cell integrity.

We hypothesized that TAM analogs and other CaM inhibiters would block hyphae formation and affect cell wall architecture in *C. albicans*. To test this hypothesis, we (1) confirmed that TAM displayed phenotypes consistent with CaM inhibition in *C. albicans*, (2) assessed the ability of these compounds to block filamentous growth formation; and (3) probed the effects of TAM and CaM inhibitors on 1,3-β-glucan architecture. In addition, (4) we tested TAM in combination with the known antifungal, caspofungin, for any in vitro synergistic interaction.

MATERIALS AND METHODS

Yeast Strains, media and culture conditions

C. albicans strain SC5314 was used for most experiments. *C. albicans* were grown overnight at 37°C in yeast extract-peptone-dextrose medium or RPMI 1640. Yeast peptone dextrose (YPD)
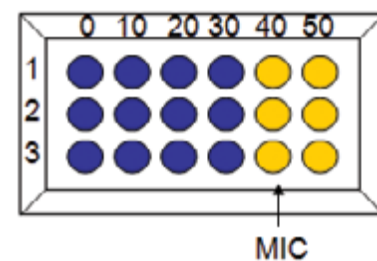
Figure 1: Schematic drawing of an MIC plate. Rows represent replicates. Columns represent drug dosage. Blue color represents growth while yellow represents clear wells.
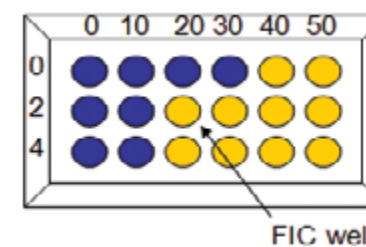
Figure 2: Schematic drawing of an FIC plate. Rows represent replicates. Columns represent drug dosage. Blue color represents growth while yellow represents clear wells.

was prepared using published recipes[4]. RPMI 1640 medium containing 0.165 M MOPS (pH 7) was prepared according to Clinical and Laboratory Standards Institute (CLSI) procedures. 80µg/mL uridine was added to YPD agar plates[14].

Minimum Inhibitory Concentration (MIC)

The MIC of a drug is defined as the lowest concentration of an antifungal agent needed to visibly prevent growth of the initial inoculum of yeast cells after 48 hours. 67 µL of an initial inoculum (final concentration 5 x 102 CFU/mL) of SC5314 was plated in a 96 well clear bottom plate. A two-fold serial dilution of the drug of choice was added in successive columns along the 96 well plates. 67 µL of RPMI/MOPS + DMSO was added to keep final DMSO concentration at 1.28%, along with 67 µL of drug for a total volume of 201 µL per well. The CaM inhibitors and antifungal drugs were tested in the following ranges: 128 µg/mL to 1µg/mL for tamoxifen and its analogs and 250 ng/mL to 1.8 ng/mL for caspofungin (all diluted in RPMI/MOPS + DMSO). The plates were incubated at 37oC for 24 and 48 hours. Figure 1 is a schematic drawing of an MIC plate.

Fractional Inhibitory Concentration (FIC)

Once the MIC's were determined for CAS and CaM inhibitors, a checkerboard experiment was performed. 67 µL of an initial inoculum (final concentration 5 x 102 CFU/mL) of SC5314 was plated on a 96 well plate. Drug A was added in decreasing concentrations across the columns, while drug B was added in decreasing concentrations across the rows. The plate was incubated at 37oC and the results were recorded at 24 and 48 hrs. The fractional inhibitory concentration (FIC) was calculated for each drug combination[8].

The Fractional inhibitory concentration (FIC) was calculated using the following formula:

FIC index = FIC of drug A + FIC of drug B

FIC of drug A = MIC of drug A in combination /MIC of drug A alone

FIC of drug B = MIC of drug B in combination /MIC of drug B alone

Synergy is defined as an FIC index of ≤ 0.5. Indifference is defined as an FIC index of ≥ 0.5 but of ≤4.0. Antagonism is defined as an FIC index of > 4.0[8]. Figure 2 is a schematic drawing of an FIC plate.

Calcium Suppression Assay

Two different YPD mixtures were made. From 2X-YP, a solution of 2% dextrose YPD and a solution of 2% dextrose YPD with 30mM of calcium were made. The solutions were divided into 2

flasks of equal volume. MIC concentrations of drug and the vehicle (DMSO) were added to the YPD and YPD + Ca²⁺ media. SC5314 were grown overnight at 37°C and the optical density (OD) was recorded in the morning. The concentration of cells was adjusted to 0.1 OD (log phase) in all flasks. The growth was measured with a spectrophotometer for 6 hours using the corresponding media (YPD or YPD⁺ Ca²⁺) as a blank.

Budding assay

SC5314 was grown overnight at 37°C in YPD to stationary phase. The stationary phase culture was diluted 1:200 in YPD. 1,2, and 5µL of the diluted cells were added to 50mL YPD flasks and grown overnight at 37oC. This protocol ensured that the cells were in log phase in the morning. The cells were then adjusted to 0.1 OD in the morning. The cells were treated with the drug for 4 hours at 37oC. The number and type of buds were then counted using a light microscope.

Actin staining

SC5314 was grown according to the budding protocol described above. After counting the number and size of buds, the cells were fixed in 10% formalin and incubated at room temperature for 30 min. The cells were then washed and resuspended in 1mL PBS with 25µL of a 200 U/mL FITC-phalloidin diluted in methanol and left to sit for 10min. The cells were then washed in PBS and observed with a FITC filter.

Filamentous growth assay

SC5314 was grown overnight at 37°C in YPD to stationary phase. A 1:50 dilution of SC5314 was incubated for 2hrs with rotation in medium M199 at 37°C in the presence or absence of sub-MIC concentrations of drug. The cells were then enumerated by light microscopy and the percent filament formation was counted.

Immunofluorescence Assay (IFA)

SC5314 was grown overnight at 37°C in YPD to stationary phase. 5µL of the overnight culture was added to 5mL YPD. The diluted cultures were treated with 16µg/mL of TAM, TOR, CLM, PRO, and TFP, 1.25ng/mL CAS (positive control) and DMSO (negative control) overnight. After treating the cells overnight, the cells were washed three times in PBS. The cells were suspended in block solution (3% BSA in PBS) for 15min with rotation at 4°C. They were resuspended in anti-β-glucan primary antibody (Biosupplies Inc., Parksville, Australia) diluted into block solution for two hours at 4°C with rotation. The cells were then washed in PBS and resuspended in a secondary Goat anti-mouse IgG with Texas red in the dark for 60-90 minutes at 4°C with rotation wrapped in aluminum foil. The cells were then imaged using a microscope

Calcium Suppression Assay in *Candida albicans*
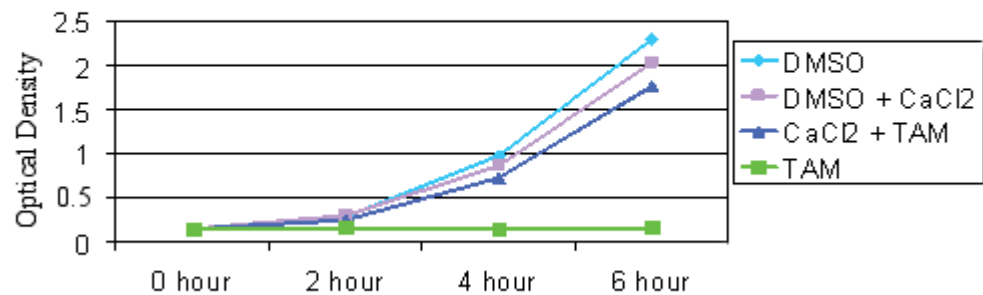

Figure 3: TAM may act as a CaM inhibitor in Candida albicans. Growth of yeast in the presence of extracellular calcium suppresses phenotypes due to CaM antagonism. To determine whether TAM acts through CaM in Candida, calcium suppression assays were completed. Candida albicans were grown overnight and then diluted to 0.1 OD in the morning. The treatment was added and the growth was measured with a spectrophotometer for 6 hours. 32μg/mL of TAM was used for this assay. The TAM-treated yeast showed no growth, while the TAM plus calcium-treated yeasts grew like the untreated control because the extracellular calcium suppressed TAM toxicity.

with a Texas red filter set.

RESULTS
TAM-treated *C. albicans* display phenotypes consistent with CaM inhibition.

These phenotypes include defects in proper actin polarization and budding. First, to determine whether TAM acts through CaM in *C. albicans* as it has been previously shown in S. cerevisiae, calcium suppression assays were completed with MIC concentrations of TAM. Figure 3 displays the results of this experiment. The DMSO (untreated) yeast showed significant growth. The DMSO plus calcium treated yeast showed similar growth to the untreated sample; these both acted as controls. The TAM- treated yeast showed no

growth as expected. The yeast treated with TAM plus calcium showed significant growth similar to the untreated sample. Extracellular calcium suppressed TAM toxicity since the TAM plus calcium treated yeast grew like the untreated yeast. The toxicity of TAM can be suppressed by growing *C. albicans* in high extracellular calcium, which is consistent with a calmodulin-based mechanism of activity.

In order to test TAM's effect on proper actin localization, *C. albicans* were treated with sub-MIC concentrations of TAM and stained with a FITC-phalloidin antibody. During budding, actin cables are formed along the long axis of the yeast which is important for establishing cell polarity. CaM is required for proper actin localization as well as new bud formation. Figure 4 shows the effect of increasing doses of TAM on actin localization in *C. albicans*. In
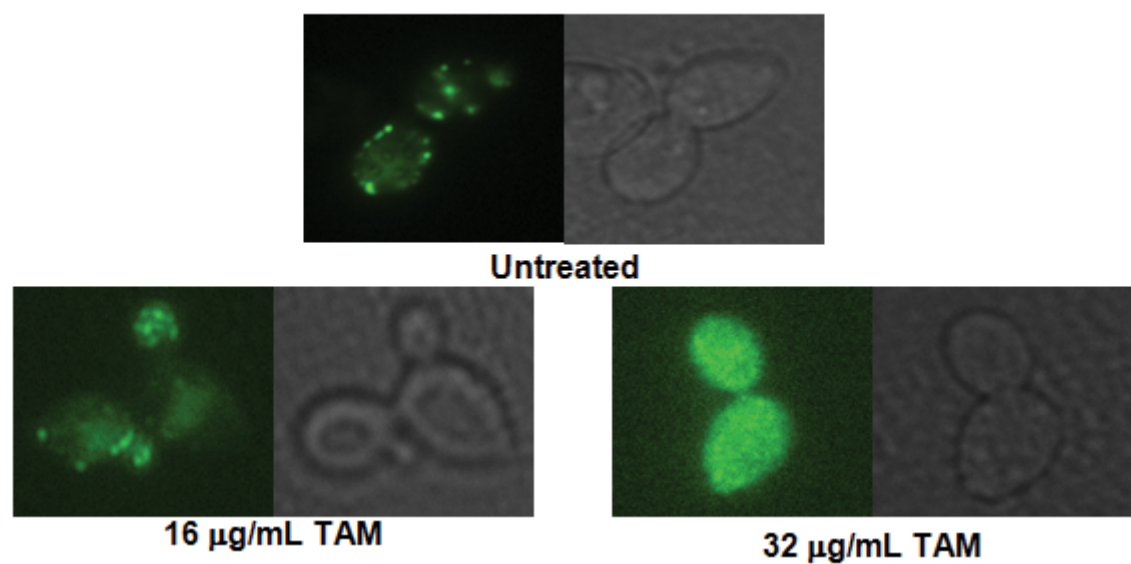

Figure 4: TAM may cause actin depolarization in *C. albicans* by disrupting the CaM signaling pathway. During budding, actin cables are formed along the axis of the yeast which are important for establishing cell polarity. CaM is required for proper actin localization. At bud scars, there is an increase in actin filaments which were detected with FITC-phalloidin. In the untreated sample, the actin is localized at the bud scars. As the dosage of TAM is increased, the actin becomes less localized. This can be seen as increasing green spots throughout the cell. TAM therefore disrupts actin localization.
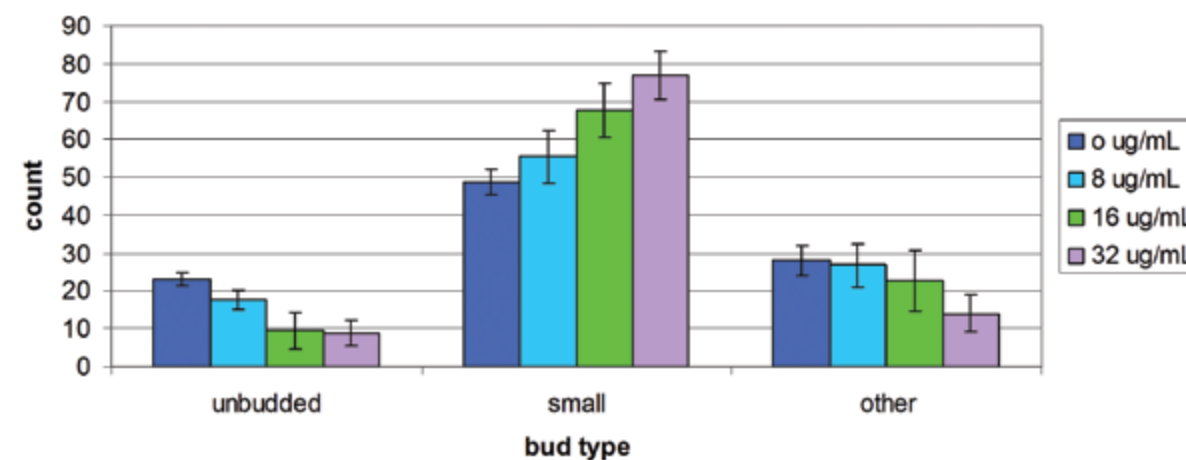
Budding Assay of TAM treated *Candida albicans*

Figure 5: TAM inhibits the transformation from small to large bud in C. albicans. SC5314 cells were cultured overnight with the respective drug concentrations, fixed with formalin in the morning and observed under a light microscope. The bud size was categorized as no-bud, small bud and other. A small bud is one that is less than half the size of mother cell. Buds that are larger were characterized as other. The mean from three separate experiments is presented. Error bars indicate the standard deviation. As the concentration of TAM was increased, there was an increase in small buds and a decrease in larger buds.

the untreated sample, the actin is localized to areas of polarized growth. As the dosage of TAM is increased, the actin becomes less localized. This can be seen as increasing green spots throughout the cell. TAM therefore disrupts actin localization. Thus, TAM may cause actin depolarization in *C. albicans* by disrupting the CaM signaling pathway.

Proper actin polarization is required for normal bud formation. Therefore, if TAM causes actin de-polarization, it can cause a defect in budding. *C. albicans* were treated with increasing doses of TAM and the number of buds was enumerated by light microscopy. The bud size was categorized as no-bud, small bud and other. A small bud is one that is less than half the size of the mother cell. Buds that were larger were characterized as other. The mean from three separate experiments is presented in Figure 5. As the concentration of TAM was increased, there was an increase in small buds and a decrease in larger buds. Therefore, this indicates that TAM inhibits the transformation of buds from small to large in *C. albicans*, a defect in budding, which is also consistent with a CaM inhibitory mode of action.

Calmodulin inhibitors block filament formation in *C. albicans*.

After showing that TAM appears to act through the CaM signaling pathway in *C. albicans*, we also tested the other CaM inhibitors for antifungal activity in previous experiments. The structures of these CaM inhibitors are shown in Figure 6. They include toremifene (TOR), clomiphene (CLM), prochloroperazine (PRO), and trifluoperazine (TFP). The MIC for all the CaM inhibitors is 32μg/mL in *C. albicans*. It was important to determine the MIC of these drugs since we want to perform experiments at sub-MIC concentrations of drugs to prevent cell death and allow for the formation of filaments.

After *C. albicans* were incubated in Medium 199 for 2 hours, filaments were enumerated with a light microscope. Sub-MIC concentrations of TAM were used to determine the effects of different concentrations on the number of filaments formed. Figure 7 shows

the average results of 3 experiments with error bars of the number of filaments formed with the differing concentrations of TAM. TAM-treated yeast showed a decrease in filament formation. There was a significant decrease in filament formation (20% filaments) at 16μg/mL, which is half the MIC.

Similar experiments were done with the TAM analogs, TOR, PRO, CLM, and TFP. 16μg/mL of each drug was used since that was the concentration of TAM at which there was a significant decrease in filament formation. Figure 8 is a graph of the results of these experiments. All the TAM analogs showed decreased filament formation. PRO and TFP were more effective at preventing filament formation than TOR or CLM.

Calmodulin inhibitors alter cell wall architecture in *C. albicans*.

The cell wall is composed primarily of mannoproteins and β-glucans. The mannoproteins span the outside and inside of the cell wall and are important in tethering the cell wall to the plasma membrane. The outer mannoproteins protect the inner β-glucan structure, which comprises the core structural component of the cell wall along with chitin microtubules. If the cell wall structure is disrupted by a cell wall targeting drug, then the β-glucans will become exposed. The primary antibody binds to the exposed 1,3-β-glucans on the cell wall. The extent of 1,3-β-glucan exposure can be enumerated using a secondary red fluorescent antibody. This experiment was done to determine whether TAM analogs would increase the β-glucan exposure (disrupt the cell wall) as TAM has already been shown to do.

We chose 1.25 ng/mL of CAS and 16μg/mL of TAM and its analogs, both at sub-MIC concentrations, to see if the drug disrupts the cell wall without killing the cells. If the cells were killed, then all the β-glucans in the cell walls would be exposed, causing the whole cell to fluoresce red.

SC5314 in log phase were used. The caspofungin-treated *C. albicans* showed significant red staining along the perimeter of the cells compared to the negative control (DMSO) which was barely

visible. This shows that caspofungin altered the cell wall so that the 1,3-β-glucans were accessible to anti-1,3-β-glucan antibodies. This has been previously shown by the Wheeler and Fink lab[19], thus the caspofungin treated cells act as a positive control for β-glucan exposure.

The vehicle (DMSO) treated cells showed minimal red staining along the perimeter of the cells. Compared to the DMSO-treated cells, the TAM, TOR, PRO and TFP-treated cells had increased 1,3-β-glucan exposure as shown in Figure 9. TAM, TFP and PRO had brighter signal than TOR-treated *C. albicans* at this dose. This assay showed that *C. albicans* cell wall architecture is disrupted by the CaM inhibitor treatment.

TAM enhances the activity of the cell-wall-targeted antifungal caspofungin (CAS).

TAM was tested in combination with the known antifungal, CAS, to see if there was any synergistic interaction between the two drugs. Figure 10 shows the FIC value calculated for the combination of TAM and CAS. As described above, an FIC index of ≤ 0.5 indicates synergy, while an FIC index of ≥ 0.5 but of ≤4.0 indicates indifference. Antagonism is defined as an FIC index of > 4.0[8]. The combination of TAM and CAS had an FIC index of 0.75. This combination showed a potential interaction in vitro, although, according to this calculation, 0.75 is considered indifferent. A value of 0.75 indicates a possible additive effect since the addition of an additional drug to CAS lowered its MIC four-fold at half the MIC of TAM. Since TAM has been shown to disrupt the cell wall, TAM treatment sensitizes the yeast cell to further inhibition of the β-glucan architecture by CAS.
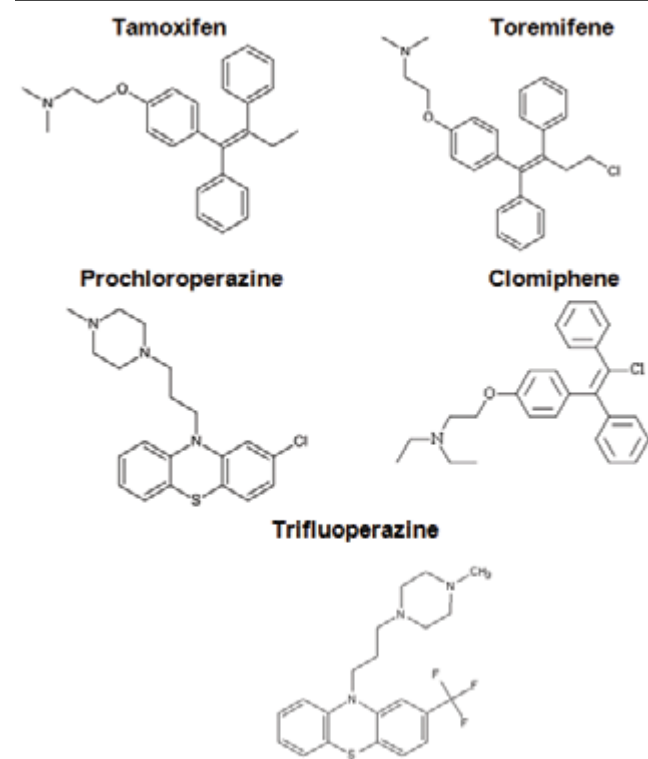
DISCUSSION

Figure 6: Molecular structures of CaM inhibitors.

S. cerevisiae have diverged evolutionarily from *C. albicans* and therefore have some structural and biochemical differences[2]. In addition, there are differences in antifungal activity between these two species. For example, the MIC of TAM in S. cerevisiae is 12μg/mL, while the MIC in *C. albicans* is 32μg/mL. Despite this divergent evolution, they do share some similar phenotypes. We therefore experimented to see if the mode of action of TAM in *C. albicans* was similar to that in *S. cerevisiae*. Through calcium suppression assays, we showed that TAM works as an antifungal by disrupting the CaM signaling pathway similar to *S. cerevisiae*.

As described above, proper actin localization is important for cellular function and morphology. TAM has been shown to disrupt proper actin localization within the cell. Cells undergo actin rearrangement to regulate such critical processes as endocytosis, cytokinesis, cell polarity, and cell morphogenesis. Early in G1, unbudded cells select a future bud site, and assemble polarity factors as well as actin cable to the site of new bud formation[9]. When the cells are exposed to TAM, this process is disrupted as a result of TAM's interaction with CaM. As a CaM inhibitor, TAM disrupts the normal signaling leading to proper actin localization. Since the cells are not able to properly form their actin cytoskeleton, new bud formation and filament formation processes are also affected.

We have shown that CaM inhibitors block filament formation and new bud formation at concentrations below MIC. Blocking filament formation has been proposed as a way to treat fungal infections because such filaments are required for virulence[7]. By themselves these CaM inhibitors have the potential to be effective antifungals since they are relatively non-toxic. In addition, these compounds could be used in combination with known antifungals to improve activity. They may have greater efficacy when combined with antifungals that have direct killing affects.

The 1,3-β-glucan immunofluorescence assays showed that upon TAM, TOR, PRO and TFP treatment, the β-glucan cell wall structure is disrupted. The extent of disruption is different among the different CaM inhibitors since their relative activities may be different. These drugs may have similar characteristics to the known cell wall stressors such as CAS. This provides insight into the potential antifungal mechanism of these CaM inhibitors. We have also shown that CaM inhibitors are additive with cell wall inhibitors. The CaM inhibitors may sensitize the cell to further inhibition of β-glucan cell wall architecture by CAS, thus suggesting that combination therapy may be feasible.

Overall, this research has direct clinical relevance. Since caspofungin and the CaM inhibitors are FDA approved, if we identify significantly active compounds, these results could be rapidly translated to clinical studies. If these drugs are found to be effective anti-fungal drugs, they could also be put into rapid use because information about their safety and pharmacology is already known. It is our hope that these experiments will help improve the outcome for patients with these opportunistic infections.
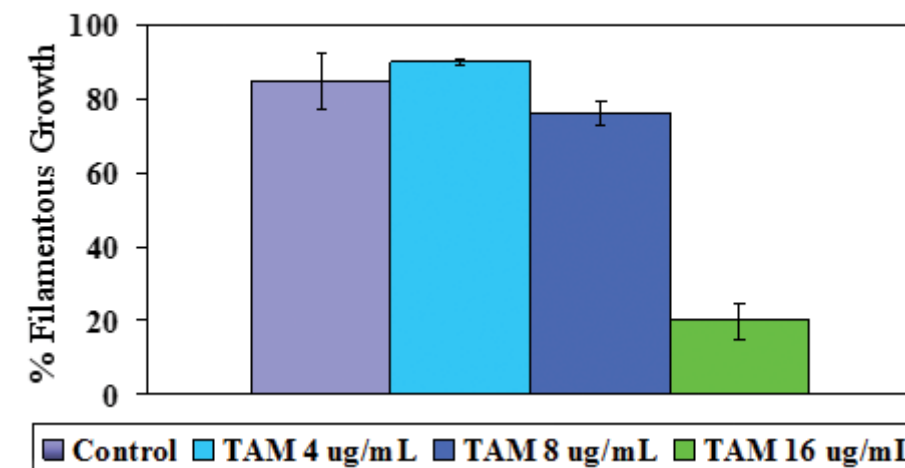
Figure 7: Filament formation is inhibited by TAM treatment, which may lead to decreased virulence. Filament formation is a key factor in *C. albicans* virulence. Filament formation was induced in *C. albicans* at various doses of TAM and quantified by light microscopy. The data presented is the mean of three independent experiments and the error bars represent the SD. Propidium iodide staining indicated that >95% of cells were viable at the time of the filamentous growth assay.
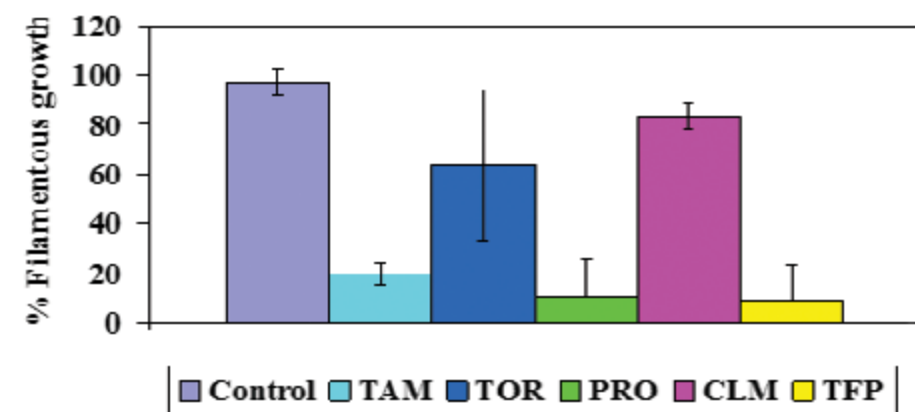
Figure 8: Filament formation was induced in *C. albicans* at 16μg/mL tamoxifen, toremifene, prochloroperazine, clomiphene and trifluoperazine and quantified by light microscopy. The data presented is the mean of three independent experiments and the error bars represent the SD. Propidium iodide staining indicated that >95% of cells were viable at the time of the filamentous growth assay.

REFERENCES

1. Beggs, WH (1993). Anti-Candida activity of the anti-cancer drug tamoxifen. Res Commun Chem Pathol Pharmacol 80:125-128.
2. Calderone, RA. Candida and Candidiasis. ASM Press: Washington, DC, 2002; 20.
3. Dagenais, T. R., and N. P. Keller. (2009). Pathogenesis of Aspergillus fumigatus in Invasive Aspergillosis. Clin Microbiol Rev 22:447-465.
4. Dean, Neta (1995). Yeast glycosylation mutants are sensitive to aminoglycosides. Proc. Natl. Acad. Sci. 92:1287-1291.
5. Gudlaugsson, O., S. Gillespie, K. Lee, B. J. Vande, J. Hu, S. Messer, L. Herwaldt, M. Pfaller, and D. Diekema. (2003). Attributable mortality of nosocomial candidemia, revisited. Clinical Infectious Diseases 37:1172-1177.
6. Kraus, P R., and Heitman J. (2003). Coping with stress: calmodulin and calcineurin in model and pathogenic fungi. Biochem Biophys Res Commun 311:1151-1157.
7. Krysan, D. J., and L. Didone. (2008). A high-throughput screening assay for small molecules that disrupt yeast cell integrity. J.Biomol.Screen. 13:657-664.
8. Meletiadis J, Verweij PE, Te Dorsthorst DT, Meis JF (2005). Medical Mycology. 43:133-152.
9. Moseley, JB, Goode, BL (2006). The Yeast Actin Cytoskeleton: from Cellular Function to Biochemical Mechanism. Microbiol Mol Biol Rev. 70(3): 605-645.
10. Paranjape, V, Roy BG, Datta A (1990). Involvement of calcium, calmodulin and protein phosphorylation in morphogenesis of Cadida albicans. Journal of General Microbiology 136: 2149-2154.
11. Parsons AB, Lopez A, Givini TE, Williams DE, Gray CA, Porter J, Chua G, Sopko R, Brost RL, Ho CH, Wang J, Ketela T, Brenner C, Brill JA, Fernandez GE, Lorenz TC, Payne GS, Ishihara S, OhyaY, Andrews B, and Boone C (2006). Exploring the mode-of-action of bioactive compounds by chemical-genetic profiling in yeast. Cell 126:611–625.
12. Patterson, T. F. (2005). Advances and challenges in management of invasive mycoses. Lancet 366:1013-1025.
13. Pfaller MA, Sheehan DJ, Rex JH (2004). Determination of Fungicidal Activities against Yeasts and Molds: Lessons Learned from Bactericidal Testing and the Need for Standardization. Clinical Microbiology Reviews. 17(2):268-280.
14. Reference Method for Broth Dilution Antifungal Susceptibility Testing of Yeast; Approved Standard Second Edition. NCCLS. M27-A2. Vol. 22 No. 15.
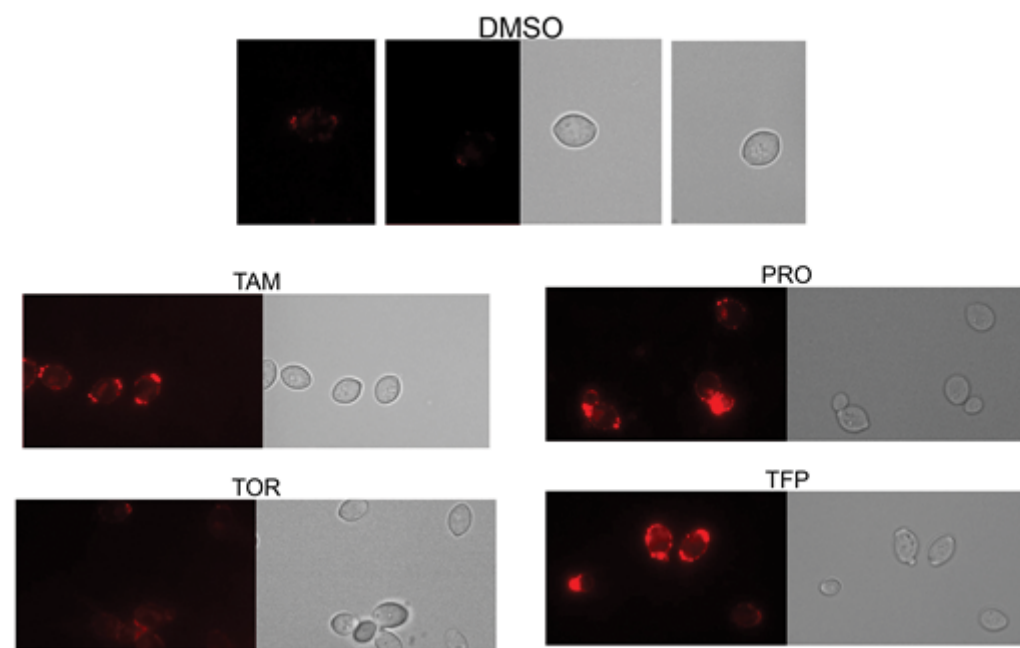
Figure 9: The C. albicans cell wall architecture is disrupted by TAM and TOR treatment, which may lead to their decreased virulence. CaM inhibitors disrupt yeast cell wall. 1,3-β-glucan exposure was evaluated in CaM inhibitor-treated Candida albicans by IFA. C. albicans yeast were treated with 16 μg/mL of drug. Following treatment, the samples were probed with anti-1,3-β-glucan antibody; primary antibody was detected by a Texas Red-labeled secondary antibody. Caspofungin is a known cell wall inhibitor; therefore, it was included as a positive control. Compared to the untreated (DMSO) cells, the TAM, TOR, PRO and TFP-treated cells have increased 1,3-β-glucan exposure.

	Strain	MIC$_{alone}$ TAM	MIC$_{alone}$ CAS	MIC $_{combo}$ TAM	MIC $_{combo}$ CAS	FIC Index TAM + CAS
C. albicans	SC5314	32μg/mL	125 ng/mL	16μg/mL	37.5ng/mL	0.75

Figure 10: MIC and FIC data for tamoxifen (TAM) and caspofungin (CAS) in C. albicans.

15. Ruiz-Herrera, J, Elorza, MV, Valentin, E, Sentandreu, R (2005). Molecular organization of the cell wall of Candida albicans and its relation to pathogenicity. FEMS Yeast research 6: 14- 29.
16. Steinbach WJ, Benjamin DK (2005). New antifungal agents under development in children and neonates. Current Opinion in Infectious Diseases. 18:484-489.
17. Sudbery, P, Gow, N, Berman, J (2004). The distinct morphogenic states of Candida albicans. Trends in Microbiology 12.7: 317-324
18. Toenjes, K. A., B. C. Stark, K. M. Brooks, and D. I. Johnson. (2009). Inhibitors of cellular signaling are cytotoxic or block the budded-to-hyphal transition in the pathogenic yeast Candida albicans. J Med Microbiol 58:779-790.
19. Wheeler RT, Fink GR (2006). A drug-sensitive genetic network masks fungi from the immune system. PLoS Pathog. 2(4): e35.
20. Wiseman, H., M. Cannon, and H. R. Arnstein. (1989). Observation and significance of growth inhibition of Saccharomyces cerevisiae (A224A) by the anti-oestrogen drug tamoxifen. Biochem Soc Trans 17:1038-1039.
21. Zaoutis TE, Argon J, Chu J, Berlin JA, Walsh TJ, Feudtner C (2005). The Epidemiology and Attributable Outcomes of Cadidemia in Adults and Children Hospitalized in the Unites States: A Propensity Analysis. Clinical Infectious Diseases. 41:1232-1239.

Tabroff

John Jaenike, Ph.D.

Professor of Biology

jur: Could you tell us about your professional background and how you became involved in research?

Jaenike: The first research I did was probably around eighth grade. My friends and I used to make rockets and we'd blast them off. I was not happy with the type of rocket fuel at the time. I made my own rocket fuel using standard methods, but wasn't very happy with the results. So I decided that I would invent a new rocket fuel. I wanted something that'd react well and something that was cheap and light so the rocket could be taken aloft. I got lucky. Unlike the most of the experiments, this one worked the very first time. That was my first experience with real research. Then, in high school, I was stuck with nothing but cookbook labs – come to think of it, it was the same in college as well. So I did not get to do real research until senior year in college.

I worked in Lincoln Brower's lab at Amherst College, and he studied the interaction between milkweeds, monarch butterflies and blue jays. Monarch butterflies feed on the milkweeds and incorporate milkweed toxins into their bodies, making them poisonous to the birds that eat them. Brower would go out capture blue jays from the surrounding area and bring them into the lab. He would then determine their behavior subsequently after having eaten these monarchs. When the blue jays ate a poisonous butterfly, they'd throw up. There's a famous picture in Scientific American showing this. Once they've thrown up, the birds would be offered a new butterfly of the same species but one that had not fed on milkweeds, which means they weren't poisonous. The blue jays avoided the monarchs afterwards, regardless of whether or not they were poisonous. So, I wanted to know if the blue jays had to throw up to learn that monarchs were bad to eat. I figured out a way to raise monarchs so that they weren't poisonous enough to make the birds throw up. This mild dosage was achieved by shifting the monarch caterpillars onto different kinds of plants during each growth period. It turns out that the blue jays hated these as well. They would eat them and they wouldn't throw up, but they'd still be miserable and subsequently avoid all monarchs afterwards. So that was a fun and fulfilling undergraduate experience, which prompted me to go to graduate school. I wrote a dissertation and so on. And now I'm here.

jur: What prompted you to pursue ecology?
Jaenike: I've loved science and nature my entire life. Ever since kindergarten, I've never lost interest in science. But it wasn't until I took ecology in college that it was clear to me that ecology could be a serious science and not just bird watching and stuff like that. That was my reasoning for studying ecology. It was nature and it was real science.

jur: What are some of the questions that ecologists are trying to answer today?
Jaenike: Ecology has turned into such an immense subject now that it's hard to imagine it being taught as a single course anymore. It encompasses everything environmentally related. Climate change, habitat alternation, alterations in biology in regards to chemical cycles, behavior ecology, mathematical models, sustainable populations in fisheries and so on – it's incredibly diverse. And important too, if you think about it.

jur: What are some of your research interests?
Jaenike: As we speak, I am setting up an experiment involving an endosymbiont. I have a strain of Drosophila neotestacea that are infected with nematodes, a type of parasite. The flies also carry Spiroplasma. If flies don't carry Spiroplasma and they get attacked by nematodes, they would be fully sterilized. However, if they do carry Spiroplasma, then they are much more fertile. Because the Spiroplasma are passed from mother to offspring through egg, by making these females fertile, the Spiroplasma ensure their own transmission. This means the Spiroplasma are helping themselves, and helping the flies as well.

jur: You mentioned nematodes. What are those?
Jaenike: They are roundworms. They're one of the most abundant animals on earth.If you eliminated everything on earth leaving only the nematodes, you would still be able to see a faint outline of the earth. They are among one of the most destructive parasites, especially in plants and animals, though most species are probably harmless. While they're not as widespread as say, microbes, they are still just about everywhere.

jur: What are some applications that could come through your research?
Jaenike: Well, the fruit flies I study feed on mushrooms so you could think of the flies as vectors that carry nematodes from one mushroom to another. Analogously, black flies carry nematodes in from one human to another, but these nematodes cause River Blindness, which affects 30 to 40 million people worldwide. The idea here is that that if we can somehow put Spiroplasma in black flies, we could reduce the transmission of these nematodes to people and reduce the incidence of River Blindness.

jur: Shifting topics, in what ways do you interact with undergraduates?
Jaenike: I teach BIO 113 – the students are great. They're smart and interested in biology. One thing I like about teaching is trying to make connections between things, which simply involves thinking about things from different angles. In fact, that way of thinking got me thinking about Drosophila, parasites and River Blindness. Of course, if some of the students in my class get really interested in biology, maybe they'll actually get involved in research.

jur: How would you suggest undergraduates get involved in research?
Jaenike: I think the key in doing research is to find something they're interested in and not simply doing research for the sake of doing research. The first thing, I think, is to figure out what they're interested in. Then they can look around for faculty to work with. It's not super-important to get started very early. Students can take courses and enjoy them before diving into serious original research.
Real research is tough. I think the first thing you should expect is for things to fail. Most undergraduate labs are designed with a specific set of instructions with expected results. In real research, however, you're looking at things no one has ever done before. You have to come up with new procedures and ideas and things can go haywire very quickly. If it goes badly, you make adjustments and do it again. I once did an experiment seven or eight times before the procedures worked. If you think it's worth it, you just have to be willing to try over and over again until it works. This isn't a bad side of research – it's part of solving a problem. Sometimes you get results that simply confirm what you expected; sometimes you get something really interesting. If you see patterns in your data that are unexpected, look deeper to see what's going on.

jur: On a concluding note, do you have any words of wisdom for our undergraduates?
Jaenike: When studying for a class, don't forget it after the final exam. Incorporate it into your own framework of knowledge – you'll thank yourself later. Overall, though, I'd say figure out what you want to do – know yourself and find your own interests.

The Role of the Writing Fellow in Spanish Tutoring

Kate Canny, 2013
Adviser: Deborah Rossen-Knill, M.F.A., Ph.D.
Department of College Writing

W hen considering strategies for tutoring foreign language writing students, the tutor must remember that "the primary focus of such writing practice 'should not be the word, the phrase, or the sentence, but the larger elements and processes that must be integrated and synthesized for effective written communication.'"[1] Many scholars agree that in teaching foreign language (L2) writing, grammar should not be of the highest concern. The main goal for writing in one's native language is effective communication of a message. As Writing Fellows, we are trained to consider global issues, such as structure, thesis, organization, and the overall communication of the message as top priorities in every tutoring session. Why, then, should an L2 tutoring session be any different?

It has been shown that the L2 writing process is actually very different from that of an author writing in his own native language. According to Jessica Williams, L2 writers tend to spend less time planning, write more slowly, and concentrate revising sentence level errors rather than on global issues.[2] It follows, then, that foreign language writers would need extra help on issues that affect the paper's overall communication. As Alice Ommagio Hadley points out, we cannot just assume the direct transfer of literary skills from L1 (native language) writing to L2 writing.[3] Because L2 students lack the implicit knowledge of the language that native speakers possess,[4] it is not surprising that a "high level of written expression is … difficult to attain in a foreign language,"[5] even for advanced L1 writers.

Because of these differences, scholars have debated the best way to teach foreign language writing. These examinations include the effectiveness of different types of feedback, being directive vs. nondirective, the helpfulness of different strategies, and which types of errors should be corrected and how. The purpose of this paper is to attempt to answer these questions for use on the peer tutoring level. As a Spanish tutor for the Writing Fellows, I will tutor students in Spanish classes at the 200 level and below. For this paper, I chose to concentrate on the 200 level, as it is the first level in the Spanish Department in which writing is assigned for the normal purpose of writing—to communicate a message—not for grammar practice. I interviewed three SP 200 instructors at the University of Rochester: Professors Beth Jorgensen, Paola Kersch, and Ryan Prendergast. I also interviewed and observed a tutoring session with Barbara Alvarez, the Spanish writing consultant. With the information I have obtained through these interviews and my research, I hope to answer the following questions: What do instructors want to see in SP 200 student compositions? What do students want to get out of Spanish writing conferences? Finally, what is the appropriate role of the Writing Fellow in Spanish tutoring, and how should the tutor conduct the session?

In order to learn what SP 200 instructors want to see in student papers, I asked each professor which aspects of writing are most important in evaluating student compositions. All three professors expressed that the overall effective communication of a message or argument takes top priority in grading SP 200 compositions. They agreed that a strong introduction and a focused thesis statement are the most important elements of a paper and often give them an immediate sense of the paper's merit. According to Professor Prendergast, teachers only need to read the introduction and thesis to know if the composition is on the right track.[6] A focused thesis statement indicates the direction of the rest of the paper and allows the reader to follow the writer's argument. Professor Kersch extends this view, saying that in addition to a coherent and solid thesis statement, she wants to see that "all of their ideas follow and support that thesis statement."[7] Teachers emphasize the importance of organization and topic sentences to achieve this goal. Paragraphs must express unity of ideas and should relate to and support the writer's argument. Jorgensen and Prendergast agree that students should tie everything together with some kind of conclusion, even if it is not separate from the rest of the paper.[8]

When asked about common global issues seen in student compositions, the professors agreed that unclear or weak thesis statements are the most frequent and problematic. Professor Kersch explained that many students construct thesis statements that are too broad—they typically provide specific details throughout the rest of the paper but fail to state their argument specifically enough in the introduction. Kersch believes that smart word choice is crucial; she advises her students to avoid generalizations and to find "the most precise, exact word to express your ideas."[9] L2 students commonly overuse "vague, higher frequency words" such as people, life, society, etc.,[10] causing their argument to appear unfocused. Prendergast echoes this view, emphasizing that SP 200 compositions are usually relatively short and that students need to get to the point right away rather than starting with generalizations or philosophical statements. Prendergast also brings up the concern that compositions are often filled with plot summary and very little analysis. He reminds students, "I'm your audience so you can assume that I know the plot."[11] A good argument, is about the "how" and "why," not about the "what."[12] Professors also noted the concern that students do not always talk about the text. Jorgensen emphasizes the importance of drawing on specific examples and direct quotes, noting that many students fail to use this type of evidence to support their argument.[13] These mistakes, professors agree, are the most common examples of structural missteps in student writing and, because they are weighted so heavily, should be the top priority in revision.

Although global issues play a significantly larger role in evaluating SP 200 compositions, professors admit that grammar is a necessary part of their grading scales. Professor Prendergast said that at the 200 level, teachers assume that basic grammar is under control but still expect to see mistakes. Barbara Alvarez, the Spanish writing consultant, also expects that there will always be grammatical errors, but that the degree to which they affect understanding will vary considerably. She emphasizes that grammar "is a major way of expressing meaning."[14] For example, one error in subject/verb agreement in a sentence can cause the action to be attributed to the wrong agent, changing the reader's understanding of the sentence. Prendergast also emphasizes that grammar becomes an issue when lack of precision impedes understanding. He believes that along with subject/verb agreement, certain other aspects of Spanish grammar, such as appropriate gender of nouns and simple and complex tenses in the indicative, should already be solidified in 200 level writing.[15]

When asked to identify specific problem areas related to grammar, Alvarez and all three instructors identified agreement between elements in a sentence as the primary issue in student writing. M. Stanley Whitley explains that in Spanish, "agreement in number and gender is carried out over everything in the NP [noun phrase] except the PP [prepositional phrase]."[16] For example, in the phrase "*la otra hija morena*," the article (la), and modifiers (*otra* and *morena*) all need to take on the feminine form to match the gender of the noun (*hija*).[17] Errors in subject/verb agreement, in which the form of the verb (first person, third person singular, third person plural, etc.) corresponds to the subject (the agent performing the action), are also common. As discussed in the preceding paragraph, such errors can seriously impede the reader's understanding of the student's intended meaning.

Students also frequently have trouble with certain distinctions in the Spanish language that are not found in English. Instructors cited the use of *para* and *por*, which both translate to "for" or "by," as a common source of confusion. According to Whitley, the word *para* expresses a goal of the movement; for example, the sentence "*La familia salió para el jardín*,"[18] ("the family left for the garden") expresses the family's movement towards the garden. Por, on the other hand, is used for "extension or movement over an area or by a point, whether through, across, past, down, up, out, or along it."[19] It also covers "prior or existing considerations"; "*Por su edad…*" translates to "for her age…".[20] These and other distinctions such as *ser*/*estar* (both translating to "to be") that are not made in English are commonly misused in L2 Spanish writing. Although these errors do not usually impede understanding because the concepts are taught so early and often in Spanish grammar classes, they fit in with Prendergast's view of "elementary level grammar" that should already be solidified by the 200 level.

Although students know that their audience and evaluator will ultimately be their instructor, the goal of a Spanish tutoring session or, for that matter, any Writing Fellow session, should not only be for the student to earn a better grade. As Writing Fellows, we aim to not only help students produce better papers, but rather to help them become better writers in the long run. To achieve this goal, we should be aware of what the student hopes to gain from the tutoring session and take care not to concern ourselves only with what the instructor wants.

Jennifer D. Ewald's study on foreign language anxiety in the classroom, although concerned with speaking in the classroom environment, can help us understand student needs in the tutoring session. Ewald finds that students' reported lack of confidence in foreign language classes which can be attributed to "lack of grammatical accuracy, classmates' perceived ability, and a need for additional grammar teaching."[21] Although tutees are not in the classroom environment during a tutoring session, the tutor must still meet these concerns. As tutors, we know that Spanish instructors care more about a well communicated message than grammatical errors, but this does not mean that we should brush aside grammatical questions just because we need to concentrate on global issues. We must be careful to meet student concerns even when we feel that there are bigger issues to address.[22] Ewald's study also finds that students become discouraged when teachers only look for mistakes to correct.[23] As tutors, we must remember that we are seen by tutees as authority figures, and that our comments can be just as discouraging as those given by teachers if given without positive reinforcement. Although Writing Fellows must be careful about giving positive feedback, Professor Kersch encourages pointing out positive aspects of the student's paper to raise the student's confidence and also to provide him or her with a model for future writing.[24] With some insight on the type of feedback to which students respond the best, the tutor will be able to avoid causing foreign language anxiety and help the student become more confident in his or her writing.

Aware of some significant instructor and student concerns about L2 writing, I will now explore the most effective ways of dealing with these concerns in a Spanish tutoring session. At the beginning of a typical Writing Fellows tutoring session, the student provides basic information, such as the class for which the paper was assigned, the prompt, and any specific questions or concerns the student would like addressed. Because this information is extremely helpful for the tutor, this part of the session should not be treated any differently for a student writing in Spanish. The tutor should, however, make sure to clarify his or her role as a Spanish tutor—specifically, how feedback will

be given. The tutor should ensure that the student understands that the tutor will not be able to comment on every single error in the text. Therefore, just because an error is not discussed, the student should not assume that it does not exist.[25] The tutor should remind the student that proofreading is still a necessary step that he or she must perform independently.

Next, the tutor needs a sense of the student's past Spanish writing. According to Professor Kersch, if the student can identify "typical stumbling blocks," the tutor will know what problems to look for.[26] Professor Jorgensen also supports this strategy, emphasizing the importance of using old Spanish papers with instructor comments.[27] If the tutor knows the student will be coming in (in the case of the Writing Fellows, if the student makes an appointment for Spanish tutoring), the tutor should encourage the student to bring old compositions in order to find these stumbling blocks and to create a meaningful plan for the session.

In order to begin the actual session, the Fellow often asks the student whether he would like to read the paper aloud himself or have the tutor read it aloud. For Spanish tutoring sessions, however, this strategy may not work as well. According to Williams, reading aloud in a foreign language can be extremely challenging and often ineffective for students. It "monopolizes their cognitive resources to the extent they are unlikely to notice much of anything in the text."[28] The goal of tutoring sessions is to first address global concerns that affect the communication of an idea so asking students to read their paper prevents processing of its content would be counterproductive.

What follows this claim, then, is the question of what to do instead of reading the paper aloud. Barbara Alvarez prefers to read the introduction first, claiming that initially working on the introduction will give the tutor clues to what the paper's biggest problems are likely to be, and that the thesis must be adjusted before the rest of the paper can be fixed.[29] However, other scholars disagree. Williams encourages reading through the whole text before making any comments in order to avoid making misleading or unnecessary suggestions.[30] This advice appears much more favorable based on Writing Fellow procedures. As I observed in my observation of Alvarez's tutoring session, focusing on the introduction without reading the rest of the paper led to a much greater emphasis on sentence level revision. As discussed previously, sentence level revision is discouraged in a Writing Fellow session before more pressing, global issues are addressed. In addition, as Professor Kersch noted, the thesis statement very often becomes much more specific and detailed as the paper progresses than it appears in the introductory paragraph.[31] Consequently, it is clear that Williams' strategy of reading the entire text, or at least skimming to get a sense of global concerns, is much more conducive to a Writing Fellow session than Alvarez's method of honing in on the introduction.

Once the tutor has a good idea of the paper's problem areas in addition to the student's concerns and questions, he must decide which strategy to begin. Most scholars of foreign language writing and teaching, as mentioned previously, emphasize the importance of concentrating on more than surface level errors. As Writing Fellows, we have spent the past semester compiling techniques and strategies designed to deal with structural, organizational, and developmental concerns in papers. If grammar does not impede the reader's understanding of the paper, a Fellow can simply apply these strategies in the same ways that we have learned. Thus, I will not discuss these specific strategies here. But what happens if grammar does impede understanding of the student's message? Rivers, Azevedo, and Heflin argue that good writing "is only possible when the writer has clarified his own thinking on the subject and knows how he wishes to present his viewpoint or develop his argument."[32] Asking the student to step back from the paper and simply explain his ideas can be extremely effective. This prevents the tutor from getting caught up in fixing grammar errors in order to communicate meaning. Understanding what the tutee is trying to say allows the tutor to remain focused on the higher priority global issues that must be addressed.

It is inevitable that compositions will have several grammar errors, and students will want to work on them. Although Professor Prendergast believes it should not be up to the Writing Fellows to fix grammar errors, Kersch, Jorgensen, and Alvarez all expressed the opinion that some errors should be discussed and fixed. The debate between scholars on this issue is the question of which errors to fix and the appropriate level of directiveness. Students make two types of errors: patterned errors and inconsistent errors. As implied by the names, patterned errors are errors of a specific grammatical construction that occur repeatedly throughout the paper, while inconsistent errors are unpredictable and are not repeated often. Many scholars and teachers argue that feedback should be concentrated on patterned errors. Rivers et al, Kersch, Jorgensen, and Alvarez argue that consistent, serious errors are the ones that need more practice.[33] However, Jessica Williams argues the opposite. She claims that inconsistency "suggests that the learner has partial control of the form and may well be ready to self-correct," while patterned errors show that the learner "does not know the form and/or perhaps is not even ready to learn it."[34] However, Kersch advises tutors to zero in on a few instances of patterned errors and if necessary, give a short grammar lesson that give the student the opportunity to correct them elsewhere in the paper.[36] Alvarez agrees, emphasizing the importance of explaining the function of specific parts of grammar and their purpose.[37] Kersch also stresses the importance of pausing and giving the student time to think and correct his or her own errors before jumping in.[38] As Writing Fellows, the limited time we have in a session restricts our possibilities for discussing grammar errors. Therefore, it is clearly beneficial to follow the patterned error method, concentrating on one or two patterns in depth in order to ensure that the student actually learns to self-correct this error in the future.

Similarly, the question of how directive the tutor should be is also the subject of debate. Levels of directiveness can range from being completely nondirective—hinting that there is an error and letting the student find it—to being very directive—pointing out the specific error, explaining why it is wrong, and explaining how to correct it. Williams considers this dilemma, explaining that if feedback is too indirect, the student may not realize what to do with the suggestion. However, if feedback is extremely direct, the student may follow the suggestion without any critical consideration.[39] Professor Jorgensen encourages tutors to lean towards being nondirective. She explains that in her own conferences with students, she prefers to hint that a problem exists and let the students find it on their own.[40] However, the qualifier to this advice seems to be that being nondirective only works when students know why their errors are wrong and how to fix them. Barbara Alvarez explained that being nondirective is difficult because in a foreign language, students do not have as much background knowledge to draw on. She believes that failing to provide any kind of solution would waste the student's time.[41] Dana R. Ferris, in her book *Treatment of Error in Second Language Student Writing*, offers the solution that direct feedback should be considered in three cases: when students are at beginning proficiency levels, when errors are "nontreatable" (cannot be explained by referencing grammar rules), and when the teacher wants to concentrate on one specific error.[42] Combining these views, the key for the Writing Fellow seems to be to begin by being nondirective and to find the best balance—direct enough that the student understands the suggestion but indirect enough that the student learns from the correction.

Finally, in order to fulfill the goal of making the student a better writer in the Spanish language, the tutor should provide writing and editing strategies that the student can use in the future. Regarding writing, scholars encourage teachers to emphasize that the "exact correspondence of ideas cannot be translated from one language into another."[43] Rivers et al. explain that many good L1 writers become frustrated when they cannot produce the same level of sophistication in their L2 writing,[44] and therefore attempt to use sophisticated ideas from their native language in their foreign language writing. Both Professor Prendergast and Barbara Alvarez also expressed the concern that students too often try to translate ideas from English into Spanish. Even planning and outlining in English can be a trap. According to Rivers, Azevedo, and Heflin, this causes the resulting writing to be "stilted and anglicized, lacking the feeling for the language and the natural flow and rhythm toward which the student should be aiming."[45] Drawing on this advice, the tutor should emphasize the importance of planning and drafting in Spanish rather than directly translating from English thoughts and ideas. Although many students feel it is easier to translate, the tutor must stress that this strategy will actually improve the flow of the writing. The Fellow can also remind the student that although the result may not be as sophisticated as his or her L1 writing would be, instructors appreciate simple, concise expression of ideas over "poorly disguised translations of their English thought."[46]

With respect to editing strategies, Williams offers some simple ideas to encourage student autonomy and self-correction. First, she suggests demonstrating the consequences of inaccuracy[47]—most importantly, the likelihood of miscommunication. She advises teachers to begin with what students know. For example, if a student needs help with verb tense, Williams suggests asking the student to highlight all finite verbs and to consider each individually and decide which tense it requires.[48] Professor Kersch describes the multiple revision method she teaches her students. She explains that revision should be treated as a process and that trying to find all errors in one revision is not effective. Thesis, organization, introduction and conclusion should be concentrated on first, followed by quotes and evidence, word choice, and finally grammar and spelling. Each of these revision strategies can contribute to teaching an L2 writer to effectively self-edit.[49] As Writing Fellows, we should attempt to pass on these editing techniques to help our tutees become more autonomous in their writing and editing processes.

As Writing Fellows tutoring L2 Spanish writers, we still have much more to learn through experience and observation of other tutors' sessions. Learning what instructors and students are looking for is an important step in understanding their expectations for the relatively new program offering Spanish tutoring by undergraduate students. Being aware that SP 200 professors most heavily weigh the effectiveness of the student's communication of an idea or argument, we can feel confident in initially overlooking sentence level issues such as grammar errors to concentrate on global issues—an approach highly valued by the Writing Fellow program for any tutoring session. We need to be aware that student writers in foreign languages can be easily discouraged by a paper full of grammar errors and that even more advanced L1 writers can feel anxiety over the inability to produce sophisticated L2 writing. We know now that in a session with students of the Spanish language, the role of feedback should be explained and that the student's past problems with writing should be considered. Reading aloud should usually be avoided, unlike in L1 tutoring. When grammar does become a legitimate concern, we should focus on a few patterned errors and teach the student to correct them independently. We should try to be as indirect as possible in order to ensure that the student understands his or her revisions, but we should not let the student leave without knowing that he or she understands why a specific error is wrong or how to fix it. Finally, we should attempt to instill good editing habits in our tutees in order to make them better writers in the long run.

Although there has been relatively little research done on foreign language tutoring, I have attempted to piece together the perspectives of Spanish 200 level instructors, authors of Spanish teaching guides, and scholars of foreign language teaching and writing to explore the appropriate role of the Spanish tutor for the Writing Fellows. This is by no means a complete guide to L2 tutoring, as many questions remain unanswered. It remains to be seen whether this research applies to all L2 tutoring or only to the Spanish language. Instructors of other languages, for example, may have different expectations for their students' compositions. Students of other languages almost certainly will not struggle with the same areas of confusion as students studying Spanish. Although this research will undoubtedly continue, this paper provides a general guide for Writing Fellows beginning to tutor students of Spanish writing courses.

REFERENCES
1. Holly L Jacobs, S. Zingraf, D. Wormuth, V. Hartfiel, and J. Hughey, Testing ESL Composition: A Practical Approach. (Rowley, MA: Newbury House , 1981) v. qtd. in Alice Ommagio Hadley, Teaching Language in Context. (Boston: Heinle & Heinle, 1993) 331.
2. Jessica Williams, Teaching Writing in Second and Foreign Language Classrooms. (New York: McGraw-Hill, 2005) 31.
3. Ommagio Hadley, 318.
4. Williams, 3.
5. Wilga Rivers et.al. Teaching Spanish. (Lincolnwood: National Textbook Co, 1988) 237

6. Prendergast interview
7. Kersch interview
8. Jorgensen interview
9. Kersch interview
10. Williams, 24.
11. Prendergast interview
12. Ibid
13. Jorgensen interview
14. Alvarez interview
15. Prendergast interview
16. M. Stanley Whitley, Spanish/English Contrasts. (Washington, D.C.: Georgetown University Press, 1986) 157.
17. Ibid
18. Whitley, 212.
19. Ibid
20. Whitley, 213
21. Jennifer D. Ewald, "Foreign Language Learning Anxiety in Upper-Level Classes: Involving Students as Researchers." Foreign Language Annals. (Alexandria: Spring 2007. Vol. 40, Iss. 1) 122.
22. WRT 245 Class Discussion
23. Ewald
24.Kersch interview
25. Williams, 107.
26. Kersch interview
27. Jorgensen interview
28.Williams, 99.
29. Alvarez interview
30. Williams, 107.
31. Kersch interview
32. Rivers et al. 290.
33. Rivers et al. 291.
34. Williams, 159.
36. Kersch interview
37. Alvarez interview
38. Kersch interview
39. Williams, 104-105.
40. Jorgensen interview
41. Alvarez interview
42. Dana Ferris, Treatment of Error in Second Language Student Writing. (Ann Arbor: University of Michigan Press, 2002) 63.
43. Daniel Cárdenas, Applied Linguistics: Spanish: A Guide for Teachers. (Boston: D.C. Health and Company, 1961) 1.
44. Rivers et al. 287.
45. Rivers et al. 292.
46. Rivers et al. 291.
47. Williams, 162.
48. Williams, 163.
49. Kersch interview

September 25, 2012

Dear Readers,

Journal of Undergraduate Research (JUR) published in May 2012 an article entitled, "The Critical Role of IFN-Gamma's Anti-Tumor Effects After Radiation Treatment," appearing in the Fall 2010-Spring 2011 issue. This article was published assuming that the listed author had informed any advisers, contributors, or his principal investigator about his intent to submit this article and had obtained their approval. We now understand that this was not the case. In light of this information, the article has since been retracted; it has been removed from our online repository, and all links to the article have been deactivated from any JUR websites.

Please consider this article and the images and data contained therein as no longer published in *Journal of Undergraduate Research*.

Sincerely,

Cameron LaPoint and Anil Taibjee,
Editors-in-Chief, Journal of Undergraduate Research, University of Rochester

New Journalism, New Ethics: The case of the Ibogaine Effect and the Writing of Hunter S. Thompson

Maya Dukmasova, 2012 & Adam Awad, 2010
Adviser: Justin Martin, Ph.D.
Department of Philosophy, University of Rochester & Department of Journalism, American University in Cairo

The sound of Hunter S. Thompson's name usually engenders a chain reaction of associations: strange behavior, drug use, guns, and many other eccentricities and idiosyncrasies of a prominent public figure and twentieth century counterculture leader. However, one must not forget that Thompson was, before all, a journalist. His work in the news business began in the late 1950s at various publications in the New York City area, including *TIME* magazine[1]. Yet it was not until the middle of the 1960s that he gained notoriety for his unusual writing style and questionable reporting techniques that would later be labeled Gonzo journalism. Thompson's in-depth reporting on the Hell's Angels motorcycle gang for *The Nation* caught the eye of other journalists and publications who sought to push the limits of traditional practices in the profession. Yet the Hell's Angels story and the book Thompson subsequently published were still far from the type of writing he would adopt in his 1971 opus, *Fear and Loathing in Las Vegas* and later in Fear *and Loathing on the Campaign Trail '72*. Of that earlier work, Douglas Brinkley, Thompson's biographer and editor said: "It is not Gonzo, it is not surreal, it is straight journalism but it's participatory."[2]

By 1972, Thompson was writing for *Rolling Stone* magazine and was sent out by Editor-in-Chief Jann Wenner to cover that year's Democratic primary elections. His articles are seen today as a staple of the avant-garde journalistic style which was famously labeled by writer Tom Wolfe as the New Journalism. Though they originally appeared as regular features in the magazine, the articles were later compiled and republished as a book.

Early on in his reports, it became clear that Thompson decided to throw his support behind George McGovern, an unlikely candidate running against veteran politicians. Contrary to other traditional journalists, Thompson was very explicit about his political allegiances. He infused his fanciful narrative style with information that was at times plain false and usually presented the candidates and campaign members he disliked in a very unflattering light. These questionable ethical practices, however, were actually in congruence with the vision espoused by the New Journalism. As we will discuss below, Thompson's lapses into fabrication and fantasy were actually evidence of a deep ethical commitment to the profession and the public, unrivaled by contemporary traditional journalists and publishers.

"BIG ED EXPOSED AS IBOGAINE ADDICT"

Four candidates were leading the 1972 Democratic primary elections: Senator George McGovern (SD), Alabama Governor George Wallace, Senator Hubert Humphrey (MN) and Senator Edmund Muskie (ME). Thompson's biased coverage revealed his firm support for McGovern very early in the campaign season.[3] He consistently presented McGovern as the underdog hero of American's conscience while ridiculing and deploring the other candidates. To Thompson, they represented nothing more than the outgrowths of the corrupt establishment. He was also a great critic of the incumbent Richard Nixon, writing that "McGovern made some stupid mistakes, but in context they seem almost frivolous compared to the things Richard Nixon does every day of his life."[4]

The 1972 election was a time of deep political and generational divisions in the United States. The Vietnam War was at its height and a central issue in the election. One of the main goals in McGovern's platform was immediate withdrawal from the war; his campaign also made many pledges that appealed to the young and politically disenfranchised demographics of the country. Thompson made it his mission to help McGovern win the nomination and attracted attention with his heavily worded criticisms of the other nominees. At one point he labeled Humphrey a "shallow, contemptible and hopelessly dishonest old hack" and claimed that he realized this by tracking the hypocrisies in Humphrey's addresses to the voters of different states.[5] However, once McGovern secured the nomination, Thompson believed that the candidate had capitulated on some of his earlier ideals. He proceeded to reprimand him accordingly for switching back to "old politics."[6]

These issues lead us to the focus of our case study: Thompson's attack on Ed Muskie. In the April chapter of *Fear and Loathing* Thompson refers to a study on the Ibogaine drug by PharmChem Laboratories in California. In it, he presented details of the effects of the drug on individuals that included "epileptic-like madness," "changes in perception" and the tendency to be disturbed by light and noise.[7] The study claimed that the drug had been legal in many European pharmacies for over 30 years, and that the Iboga plant root originated from West Africa. It also stated that the drug could be used as a "stimulant," "aphrodisiac" and "inebriant."[8] This research was the basis of Thompson's allegations on the pages of *Rolling Stone* that Muskie was addicted to Ibogaine. He also mentioned the presence of a "mysterious Brazilian doctor" in Muskie's entourage to administer the drug.

Thompson then reinforced the Ibogaine story by relating the alleged drug abuse to Muskie's suspicious behavior on the campaign trail. First, he blamed it for the candidate's emotional breakdown in New Hampshire. In February of that year, Muskie and his wife were attacked by the *Union-Leader*, a newspaper in Manchester, NH. In an anonymous letter printed in the paper, Muskie and his staff were accused of having referred to Americans of French-Canadian descent (an important voting demographic in New England) as "Canucks."[9]Additionally, the paper had printed an editorial which "impugned the behavior and character of the candidate's wife."[10] While giving a response speech in a snow storm in front of the newspaper office, condemning its publisher William Loeb, Muskie appeared to have started crying.

News of the "crying speech" spread like wildfire and was thought to be a determining factor in the candidate's poorer-than-expected performance at the polls nine days later.[11] Muskie claimed that he had not actually been crying and that it was just snow in his eyes. However, it is popularly believed that he in fact broke down.[12] Most observers connected this "breakdown" to the candidate's overwhelmed state in light of the attacks made by Loeb's paper, but Thompson had another explanation: He claimed that this was the "Ibogaine effect" in action, causing Muskie to become hysterical.[13] Thompson also alleged that Ibogaine was to blame for Muskie's erratic behavior during other speeches, including one in Miami, Florida when he angrily reprimanded drunk hecklers.[14] Further, he wrote that Muskie's excessive eye rolling during TV interviews and his "babbling rages" were caused by a "bad Ibogaine frenzy." Thompson even went as far as to say that Muskie had been hallucinating "Gila monsters" in the crowds, which caused his brain to paralyze.[15]

It is noteworthy that by the end of the chapter on Muskie's Ibogaine abuse, Thompson insinuates that his allegations aren't facts. "[we] can only speculate on this," he writes. He also avoids further verification of drug abuse by saying that the Brazilian doctor on Muskie's team was nowhere to be found.[16] This vagueness indicated to many that the accusations did not hold water. However this did not stop other journalists from using the allegations as fact.[17] According to the editors and critics interviewed in Gibney's film, other news reporters picked up the allegations of Ibogaine abuse. "Reporters believed it enough that they asked Muskie about it at press conferences," said John Burks, former managing editor of *Rolling Stone*. This came as a shock to Thompson and his colleagues at the magazine. Charles Perry, editor of *Rolling Stone* recalled receiving and printing the original piece: "First we saw this word [Ibogaine], then we had to look it up. And then we started wondering if somebody could sue us about this. Then we realized how silly that would be so we went ahead with it."[18] While Gibney's *Rolling Stone* interviewees insisted that even reporters who had been following Muskie for several months took the accusations seriously, McGovern campaign strategist Frank Mankiewicz claimed that everybody was aware that these allegations were ridiculous.[19]

Despite the division of opinions about the amount of sway this story actually had with the public and other journalists covering the campaign, the fact remains that the story of Muskie's Ibogaine abuse was fabricated. In an interview with Playboy magazine a year after the publication of *Fear and Loathing on the Campaign Trail '72*, Thompson openly admitted the falsity of his allegations. He defended himself by claiming that he "didn't say he was taking [Ibogaine]"; he simply said that there was a rumor of a Brazilian doctor bringing Muskie Ibogaine packets. He then said "who would believe that…?"[20] In another interview on a 1970s talk show Thompson openly declared that he "started the rumor in Milwaukee."[21]

NEW ETHICS FOR THE NEW JOURNALISM

One of the fundamental necessities in considering the case of Hunter S. Thompson's writing and its ethical implications is the idea that journalism genres do exist. Far from being a monolithic, uniform type of literary activity guided by one set of professional and stylistic standards, journalism takes on diverse forms in the service of the truth and the public. Journalism is not just writing the news, it can also be satire, muckraking, yellow journalism (tabloids), investigations, photography and illustration, editorials, and feature writing. Over the years, standards of objectivity and truth have been challenged by individual journalists and organizations. These notions, and how they are to be represented, may change over time among different groups of people. "The truth of all writing is a matter of social negotiation. To say a report is true is to affirm that it speaks the consensus of some actual community of interpreters... In turn, disagreements over truth signal appeals to different communities of interpretation, with their own standards of evidence, significance, and style."[22]

The other important element to consider in an analysis of Thompson's work is the context of the time period in which it was produced. The 1960s and 70s were decades of great social upheaval, technological progress, and generational conflict in the United States. In one of the most thoughtful and detailed analyses of Thompson's work and the wider movement it represented, John J. Pauly of the University of Tulsa describes how these tensions played out in journalism:

"Journalists who wrote in a distinctive personal voice wanted to be free to tell stories as they saw them, without being shackled by institutional conventions of objectivity. They thought that personal involvement and immersion were indispensable to an authentic, full-blooded account of experience. Detractors, especially editors, abhorred that personal voice, because they felt it betrayed the public's trust in journalism as unbiased fact. The controversy clearly went beyond narrow matters of literary technique, for it alluded to ubiquitous arguments about journalists' sincerity, authenticity, and loyalties. 'Personalism' articulated young journalists' newly imagined connection to the people and events they reported. As a style of political commitment, personalism apposed itself to the thin-lipped,

emotionally repressive style of middle-class worklife. In journalism that conflict over cultural style often played itself out in newsroom confrontations that were at once generational as well as professional. Young reporters refused to remain laptop dummies who lip synched the newspaper's institutional voice. They demanded official recognition that they were the ones in the streets, close to the real action. Editors resisted such nonnegotiable demands. To them personalism was the chant of a permissive and disrespectable age, in which lazy, self-indulgent young reporters refused to accept their professional, institutional responsibilities."[23]

In 1973, Tom Wolfe wrote the seminal work *The New Journalism* to demonstrate emerging trends both in coverage of the news and in non-fiction literature. In this book, Wolfe argued that the introduction and indeed the already existing use of literary techniques in journalistic writing by the likes Thompson, Norman Mailer, and Gay Talese were effective ways to capture the spirit of a new era of unprecedented social changes and cultural upheavals. Wolfe defined four key techniques that set this New Journalism apart: scene-by-scene construction of the events of the story, the recording and reporting of dialog, the use of a third-person point of view, and status details about the settings of events.[24] The result was a blend of factual information with a subjective perception made explicitly transparent by the writer's admission and embrace of his/her limited scope on the events in which he or she participated and observed.

Fabrication is unethical by traditional journalistic standards, but is subjectivity unethical as well? Thompson's work has been praised by critics and no lawsuit was ever filed against him for the false allegations he made about Muskie or any other candidate for that matter. Even political figures Thompson had insulted and chided in his articles, including Jimmy Carter and Pat Buchanan recognized the virtue of his style. Frank Mankiewicz, senior strategist for George McGovern repeatedly stated that Thompson's was "the most accurate and least factual account" of the 1972 campaigns.[25] Here we come to two concepts that were central both to Thompson's journalistic endeavors and the New Journalism establishment: the idea of the truth and the hegemony of the media over the presentation thereof.

If journalists are supposed to operate in the service of the truth before all, then Thompson's work can be understood as just to the spirit, if not the letter, of the truth. Thompson had a very clear, moralist approach to politics in America. He loathed Richard Nixon and considered his policies, not the least of which the war in Vietnam, as deeply harmful to the nation. As a responsible citizen, he then took it upon himself to work for the cause that was right in his eyes through the medium of journalism. In a 1997 interview with *The Atlantic* he said "I don't get any satisfaction out of the old traditional journalist's view - 'I just covered the story. I just gave it a balanced view.' Objective journalism is one of the main reasons American politics has been allowed to be so corrupt for so long. You can't be objective about Nixon." He continued: "If you consider the great journalists in history, you don't see too many objective journalists on that list. H. L. Mencken was not objective. Mike Royko, who just died. I. F. Stone was not objective. Mark Twain

was not objective. I don't quite understand this worship of objectivity in journalism. Now, just flat-out lying is different from being subjective."[26]

Pauly writes that New Journalism "challenged the authority of journalism's empire of facts."[27] In the contemplation of journalism ethics, it would be a mistake not to consider the role journalists themselves play in a construction and perpetuation of a certain kind of truth. This truth reflects realities about its writers and the establishments which publish it as surely as humans can never be separate from the history and interests that shape their perception and understanding of the world. Even journalists cannot escape this fact of being human. Traditionally, they have tried to balance their own shortcomings as flawed individual onlookers by interviewing a variety of other observers and avoiding voicing their own analysis of events in news coverage. New Journalists on the other hand, while operating from the same desire to present the public with the most accurate information about events, decided to honor their subjectivity and acknowledge their biases up-front. They did not shy away from exaggerations and distortions as well as stylistic unorthodoxy to accomplish this task. Perhaps this is not what journalists are supposed to do, but Thompson, Wolfe, and other New Journalists were against the idea of a politically and culturally disengaged journalism. This is why they decided to write differently. "Professional journalisms's truth," Pauly argues, "which never stands unchallenged, has rarely been as fiercely contested as it was in the late 1960s and early 1970s."[28]

The New Journalists mentioned by Wolfe were mostly in their twenties and thirties in the period, and like the rest of the youth of America, sought to change their society. Thus, the conflict between the ethical standards of traditional and New Journalism can also be understood in generational terms. "The more gentle souls among the editors sometimes counseled patience with the young, and the braver ones even noted the hypocrisy of the establishment's own ethics, which encouraged editors and publishers to support the United Way and the Chamber of Commerce but not SNCC or Mobe."[29] He continues:

"Part of New Journalism's distinctive political contribution was certainly its fascination with culture. In the traditional newsroom, culture has always remained a residual category, the social stuff to be cleaned up by female writers after real men had devoured the political issues of the day. In the New Journalism, however, culture - often experienced as the politics of style - supplied the very substance of the reporting, and the attempt to report on culture usefully complicated discussions about the truth of nonfiction writing."[30]

Simply put, while the traditional journalistic establishment is concerned solely with the question "what is the truth that we need to report?", their attempts to answer are unfortunately not infrequently marred by corporate interests. The New Journalists, on the other hand, asked the additional question of "whose truth are we reporting?".

PURE GONZO

Is it ethical to excuse the bending of ethical norms in the process of reporting if the final product is in the service of the public good and no serious harm is done to those being mocked of or demonized? After all, these exceptions are widely made

for satirists, so why not occasionally extend them to reporters? "The strongest objection to conventional journalisms's truth is not that it claims to be representational or objective, but that it unilaterally asserts rather than fully argues its truth claims, The strength of a newspaper's interpretations are rarely tested by a community of readers."[31] The Union-Leader case in the story of Muskie's campaign is a perfect example. The publisher of that paper had a clear political agenda: "Loeb had been giving Muskie the same brutal front-page editorial 'treatment' he had given other moderates and liberals in both parties who appeared to threaten the publisher's favored right-wing candidates."[32] This clearly reflects how biases tend to find their way into traditional media in ways that are more subversive than Thompson's outrageous claims.

Ultimately, the unethical conduct of Loeb did much more to harm Ed Muskie's campaign than did Thompson's phantasmagoria. Many people never even found out that the "Canuck" letter was a fabrication made by members of the Nixon administration.[33] On the other hand, the seemingly dishonest writing on Thompson's part was actually a manifestation of high ethical standards on several fronts. Thompson behaved in a way that is suitable for a truly engaged citizen of a democracy, by using his skills and knowledge in the collective struggle for desired change. Second, he overtly presented his biases and political positions to the public, thus allowing people to clearly understand the political implications of his reporting. In so doing he was able to afford a fruitful stylistic experimentation which attracted readers and further aided in the goal to involve the public in the nation's politics. This is a goal that should be logically consistent with the work of journalists who are agents of democracy. In the end, the wild and deranged stories Thompson told from the 1972 campaign trail probably did more good for journalism than they did harm to the public or politicians. "He's not trying to fool you," Tom Wolfe reflected, "you know immediately that he is filtering reality through what Hunter called Gonzo."[34]

REFERENCES
1. Brinkley, Douglas. eds. The Proud Highway: Saga of a Desperate Southern Gentleman. New York: Ballantine, 1998. p. 139.
2. Gibney, Alex. Gonzo: The Life and Work of Dr. Hunter S. DVD. 2008. Magnolia Pictures.
3. Carroll, Tobias. "Tribeca Film - Features - Hunter S. Thompson: Persona and Art." Tribeca Film. Accessed November 27, 2010. http://www.tribecafilm.com/news-features/features/Hunter_S_Thompson_Persona_and_Art.html.
4. Thompson, Hunter S. The great shark hunt: strange tales from a strange time. New York: Simon and Schuster, 2003. p. 230.
5. Seligson, Tom. "Fear and Loathing on the Campaign Trail '72." New York Times, July 15, 1973. Accessed November 27, 2010. http://www.nytimes.com/1973/07/15/books/thompson-1973-trail.html.
6. Ibid.
7. Thompson, Hunter S. Fear and Loathing: on the Campaign Trail '72. New York: Warner, 2006. p. 151.
8. Ibid., p. 150.
9. Bernstein, Carl, and Bob Woodward. "FBI Finds Nixon Aides Sabotaged Democrats." The Washington Post, October 10, 1972, sec. A, p. 01.
10. Broder, David. "The Story That Still Nags at Me - Edward S. Muskie." Washington Monthly, February 1987 Accessed December 1, 2010. http://findarticles.com/p/articles/mi_m1316/is_v19/ai_4696993/. p. 1
11. Ibid.
12. Shribman, David. "The Muskie Moment." Pittsburgh Post-Gazette, October 31, 2010. Accessed November 29, 2010. http://www.post-gazette.com/pg/10304/1099095-372.stm.
13. Thompson, Fear and Loathing: on the Campaign Trail '72, p. 151.
14. Gibney, Gonzo.
15. Thompson, Fear and Loathing: on the Campaign Trail '72, p. 151.
16. Ibid.
17. Gibney, Gonzo.
18. Ibid.
19. Weingarten, Marc. The Gang That Wouldn't Write Straight: Wolfe, Thompson, Didion, and the New Journalism Revolution. New York: Crown, 2006. p. 260.
20. Thompson, Hunter S., Beef Torrey, and Kevin Simonson. Conversations with Hunter S. Thompson. Jackson: University of Mississippi, 2008. p. 20.
21. Gibney, Gonzo.
22. Pauly, John J. "The Politics of the New Journalism," in Literary Journalism in the Twentieth Century, ed. Norman Sims. New York: Oxford UP, 1990. p 122.
23. Ibid., 114.
24. Wolfe, Tom. The New Journalism. New York: Harper & Row, 1973. pp. 31-33.
25. Gibney, Gonzo.
26. Hahn, Matthew. "Writing on the Wall: An Interview with Hunter S. Thompson." The Atlantic, August 26, 1997 Accessed November 30, 2010. http://www.theatlantic.com/past/docs/unbound/graffiti/hunter.htm.
27. Pauly, "Politics of the New Journalism," p. 110
28. Ibid.,115.
29. Ibid., 118.
30. Ibid., 121
31. Ibid., 122
32. Broder, "Story that Still Nags Me," p. 1.
33. Bernstein and Woodward, "FBI Finds Nixon."
34. Gibney, Gonzo.

Rightful Claim: Israel's Primordialist-Constructivist Approach to Urban Planning and Policy in Jerusalem

Jessica Gambacurta, 2010
Adviser: G. Bing Powell, Ph.D.
Department of Political Science

T he city of Jerusalem is sacred to three of the world's most important monotheistic religions: Judaism, Christianity, and Islam. It lies between two territories, Israel and the West Bank, and encompasses the complexities and problems that plague its governance. Though religious divergences may characterize the crucial emotional aspects of Jerusalem politics, some issues are purely economic and social. In this city of multitudes—of peoples, of religions, and of changing histories and historiographies—some of constituents' most essential issues are not ideological or historical (awkward phrasing). Instead, the issues that are most important to these citizens, particularly the Arabs, pertain to bread-and-butter issues: these issues directly affect people's well-being and standard of living. Perhaps these concerns are even more important than those ideological and historical ones, for these are pervasive. Jerusalem, which resides under mostly Israeli authority, has excluded Palestinian Arabs from resources and development that would qualify under the overarching bread-and-butter category.

Jerusalem is a particularly special city, as its planning and management involves "nationalistic symbols and ideological emotions regarding space and territory," which thus attracts international, national, and local perspectives.[1] Arab exclusion in Jerusalem has traditionally pertained to land use and zoning. Though urban planning in Jerusalem has often focused on religious monuments, the main problematic issue is that of housing development and regulations for the Arab communities in the city.[2] In this paper, I first briefly evaluate Jewish housing development and land use expropriation in Jerusalem since 1948, with a specific emphasis on the reconstruction of the Jewish Quarter. Second, I turn to current Israeli land use laws and codes to determine the official policies on Arab rights to build and maintain public and private space. Finally, I look at the most recent issues being raised in Jerusalem urban planning to examine the prospects for increasing equality between Jews and Arabs in terms of land use and housing; I draw from equitable urban plans to formulate these suggestions. I posit that Jerusalem's city codes and Israel's national policies have excluded Arabs from basic necessities through a combined primordialist-

constructivist approach to urban planning.

THE DEVELOPMENT OF THE JEWISH QUARTER IN JERUSALEM AND ITS IMPACT

Since its establishment in 1948, Israel has focused on absorbing Jewish immigrants and providing them with space, housing, and basic necessities. However, the land of Israel was previously occupied by Palestinian Arabs, who have been displaced by the influx of Jewish settlers on to their lands. Even more problematic, the Israeli government has at times authorized municipalities, such as that of Jerusalem, to legally displace the Palestinians. In this section, I explain the ethno-ideological basis of these actions and the development of the Jewish Quarter as a mechanism of Arab exclusion.

Israel, which was founded on the basis of Zionism, focused in its early years on "redeeming the land" and recapturing the spirit of Jewish heritage.[3] However, at first, Zionism's emphasis on political gains and the reestablishment of Israel as the Jewish homeland led to an initial focus on Tel Aviv; Jerusalem only became important later as people sought to develop the Holy City into a suitable living environment for the Jews.[4] Prior to 1948, the Armenian cathedral, the Syrian and Maronite convents, and four small Muslim quarters bordered the small, pre-existing Jewish Quarter.[5] Starting in the 1950s, development towns throughout Israel became a model for what would later occur in Jerusalem, whereupon Jewish settlers created artificial towns on mostly Palestinian lands in order to disperse the indigenous population, absorb the immigrants, and provide security for the Jewish homeland.[6] The motivation behind these acts are based on the myth of territory for Jews[7], as the Old City of Jerusalem is essential to religious mythology and ideology within the Arab-Israeli conflict as well as the very existence of Israel.[8]

Essentially, the concept of myth in relation to Jerusalem defends Israeli development and reconstruction of the Jewish Quarter, thereby warranting the demolition and destruction of monuments and neighborhoods in order to establish Jewish living space in Jerusalem. The Israeli government, through the local municipal authorities, has offered archaeological excavations as a basis for this reinvention of Jerusalem,

stating that the Jews have claims to the land.[9] As a result, the reestablishment of the Jewish Quarter in Jerusalem began soon after the formation of Israel, its plan reflecting "the geopolitical and environmental values and ideologies that Israel [wished] to impose in order to strengthen its dominance and control over the city."[10]

One example of this land appropriation and use can be seen in the renaming of streets in Jerusalem to fit the Jewish settlers[11], which asserts the desire to create a spatial identity delineating the idea of 'ours' and 'yours.' Furthermore, Israel's dedication to preserving the identity and heritage of monuments has been focused solely on Jewish monuments (using ones sounds a bit weird), as exemplified in the demolition of the Moroccan Quarter in 1967[12]; this effectively erased the architectural value and historical identity of Arab monuments. The destruction of the Moroccan Quarter took roughly five days, leaving residents with approximately two hours to depart from their houses and property before dynamiting would begin; around 135 houses and 650 people were displaced by this demolition.[13] The government also elected to absorb old quarters and neighborhoods (such as the Moroccan Quarter) into the Jewish Quarter in order to declare Jewish ownership of the land, reaffirm the defense posts from 1948, and appropriate as much land as possible[14] without upsetting the Status Quo agreement.[15] The rationale for this incorporation of former Arab districts in Jerusalem into the Jewish Quarter was that the Arabs existed there only as "subtenants" until the true "tenants" (the Jews) could return and reclaim their land rightfully.[16] This line of thinking has reified the expulsion of Arabs from the Moroccan Quarter, as well as the districts of ash-Sharif, Bab al-Silsilah, Darj al-Tabouna, and the former Jewish Quarter.[17]

These explanations that the Israeli government and Jewish settlers have provided to defend their actions in demolishing prior buildings, monuments, and districts are based in an ethno-religious ideology. This ideology is connected to archaeological excavation in order to prove Jewish heritage and to focus on Israel's historical and biblical rights to the city; in essence, it is an ideology that bound ethno-religious issues to space and territory.[18] This mentality is rooted in the idea that some people—in this case, the Jews—have a more salient claim to the land and space because they believe they are ethnically and religiously superior in some way. I argue that David Brown's research on languages of nationalism and identity is applicable to Jerusalem urban planning because the Jewish settlers subscribe to a combined primordialist-constructivist approach to understanding nationalism and authenticity.[19] The primordialist approach to conceptualizing nationalism is based on distinctive linguistic, racial, religious, or origin-oriented characteristics that tie individuals together emotionally to form a communal ethno-historical consciousness.[20] It stresses kinship and authenticity as associated with ethnic commonalities. On the other hand, the constructivist approach explains nationalism as an ideological framework; in this sense, the Jewish heritage and identity, though primordialist, can also be considered an ideology through which individuals and communities can filter reality.[21] A combined conceptualization of Israeli Jewish nationalism provides insight as to how the Israeli government has handled the situation of Jewish settlements in Jerusalem: the feeling of being both

ethically and ethnically right validates Jews' annexation of quarters and neighborhoods in Jerusalem. Additionally, the settlers have operated under the guise of security concerns and the desire to make Israel truly theirs, which few governments or regimes could deny to them given the Holocaust's devastation. By utilizing evocative messages and emphasizing Israel's primary concern of security and defense, the new immigrant settlers could, in the early years of the state, justify their actions.

The emergence of Jewish settlements in Jerusalem primarily arose in the area West of the Old City, where its population often refrained "from mixing with their neighbors, a tradition that reflected centuries of discrimination in widely scattered areas."[22] This is apparent in the settlers' decision to maintain the pre-existing cul-de-sac style street layout, which would allow the Jews to maintain a separation of public and private space and residential areas can be separated from tourist areas as well as the undesirable Palestinians.[23] In establishing their right to the city, the settlers used planning against the residents who had lived there previously, working to institute gentrification and ethnic segregation.[24] One example of this is in the case of the Isawiye village near Jerusalem. Prior to 1967, the residents owned approximately 10,000 dumans of land; this would later be reduced to 2,700 dunams after 1967 and then again to 800 dunams through Jewish expropriation.[25] This annexation resulted from a 1973 Israeli policy to disperse the Arab population and to define public space with beautification and thus gentrification efforts of garden creation and park building for Jewish settlers.[26] The Isawiye village's proximity to Hebrew University in Mount Scopus and its status as a "green zone" disabled the Palestinians from constructing housing on the land in order to preserve the aesthetic aspects of the Old City.[27] This concept of a "green belt,"[28] which was appropriated from the British, is a subtle way of constraining the Arab populations and gentrifying certain neighborhoods for Israel's benefit—a concept that still exists today.

The actual building projects in Jerusalem after the creation of the Israeli state were quite clearly designated for Jews; the Jewish Quarter of Jerusalem was a priority and had few budgetary restrictions[29], and addressed Orthodox concerns such as dual sinks in kitchens.[30] Also throughout the years developed a Jewish colonialist mindset toward the Arabs. At first, in an effort to make more room for Jewish settlers, Palestinian heritage or Arab monuments were demolished and seen as culturally wrong.[31] Later, as the Israeli state developed further, the government seized Arab and Palestinian heritage in Jerusalem as a tourist attraction, exploiting the ethnic and religious qualities of the displaced people.[32] These social and planning attitudes about Israel were given high priority, and emphasized focusing on either Jewish residents or non-resident tourists[33], therefore reflecting the Israeli attitude toward Palestinians in general: this attitude is one of ignorance and exploitation.

THE USE OF LEGALITY AND MUNICIPAL CODES TO CONSTRAIN ARABS IN JERUSALEM URBAN PLANNING

The Israeli government and the Jewish-dominated city of Jerusalem have played an important role since 1948 in subtly yet surely expropriating Palestinian land and districts based on a combined primordialist-constructivist attitude; this mindset

stems from a feeling of ethic and ethnic superiority and a desire to gentrify the Holy City through the displacement of Palestinians and the construction of the Jewish Quarter. As the governance of Jerusalem has become more complex because of its multiplicity of identities, religions, and peoples, so have the laws and codes that have developed. Yet still, the legality behind these laws have effectively constrained the Arabs' ability to create living space or appropriately address the needs of their communities; one such example of this is the Military Order No. 150 of 1968, whereupon the Israeli Custodian of Absentee Property was authorized to expropriate land belonging to Palestinians who were not recorded in the official East Jerusalem census post-1967.[34] Yet thousands of Palestinians had no way to know this, since the order was established *ex post*. In this section, I look at the installation of various laws and codes that have been instrumental in reducing Arabs' political power in Jerusalem's urban planning.

Jerusalem has been a unique case in urban planning because of the intimacy of its citizens, who have "a life of encounters, proximity, and interaction, yet remote, extraneous, and alienated."[35] The basic structure of how urban planning functions in Jerusalem further solidifies the barriers to development and planning that Arabs in the city face; the Ministry of the Interior regulates issues and locations of national significance[36], while a local municipal planning commission focuses on implementation.[37] However, the local commission, though with more real power, is unable to make independent decisions. At the municipal level, there is also the problem of the multiplicity of actors ranging from public to private, local to international.[38] The combination of these two planning systems that work together in a top-down format has hardly addressed Palestinian building and land use concerns to achieve Judaization.[39] The political expression of this process, through laws and regulations, has manipulated Palestinian freedom within urban planning. One such issue is that of building permit regulations: "between 1968 and 1974 only 58 permits were issued. In recent years about 150 permits per year were issued."[40] By installing legal frameworks to determine and issue permits for building, the municipal government is able to justify their displacement of Palestinians in areas without permits in the courts or to the federal government. Also, in constraining the number of buildings despite the demographics, Israel can disperse the concentration of Arabs in order to achieve Judaization; this process encourages official declaration of landscape preservation to confine and blockade Palestinians from branching outward, as well as adopting planning policies that are unfavorable for Arab neighborhoods.[41]

By annexing Palestinian lands, Israel has been able to control parts of Arab Jerusalem, which it obtained after 1967.[42] Active, usable Arab Jerusalem today occupies roughly 26 square kilometers, or about 23 percent of the total area of East Jerusalem available. However, with the institution of green space and landscape preservation laws, Israel has commandeered this land from Palestinian development in order to beautify and gentrify Jewish Jerusalem.[43,44] This persists today, as Israel carries out an extensive $100 million development plan to clear rubbish dumps and wastelands into gardens and parks, "along with new signs and displays that point out significant points of

Jewish history."[45] Even more problematically, the plan entails the usurpation of Palestinian property in East Jerusalem by legal and destructive means. The classification of land as a green area forbids the owners from developing the land, even if the owners are individual landowners.[46] (Though the reasoning that Israel offers for the "open views on the landscape" are theoretically environmentally sensitive, it only "cynically disguises its political purpose."[47] For later, these supposed green spaces could later be expropriated to Jews seeking settlements.) Prime Minister Netanyahu, as quoted in *The New York Times*, has even stated the following: "I intend to act on this issue with full strength. This is the land of our sovereignty. Jewish settlement there is our right."[48]

The logical basis for this contentious decision is lacking; instead, Netanyahu resorts to the evocative, ethnic, and ideological arguments of the primordialist-constructivist approach to defending Jewish settlements. One leftist activist who supports the binational solution to the Arab-Israeli conflict believes that the plan attempts to create "an ideological tourist park that will determine Jewish dominance in the area."[49] Though the action is important to understanding this approach to urban planning, it is an incomplete assertion; it is the *attitude* and mindset of the dominant urban planners in Jerusalem who have already decided how participation and space will be distributed. Chairman Benjamin Kedar of the Israel Antiquities Authority confirms this, stating that the archaeological manufacturing to defend the Jewish settlements in Jerusalem has "a pronounced ideological agenda."[50]

Returning to the case study of Isawiye, we also observe the deficiency in social services provisions. The overwhelming increase in population density and lack of sufficient housing has led its residents to utilize the 43rd amendment to the 1965 Planning and Construction Law.[51] The 43rd amendment, which is by and large exclusive to Jews, provides a voice to the public who claim ownership to the area under planning or have a vested interest in the area under planning.[52] Isawiye residents attempted to contest the lack of infrastructure, though their proposal was 'delayed' because of the outbreak of the second Intifada. Thus, though the Israeli government has made allowances for the institutional mechanisms to affect change and become involved in the urban planning process, some constituents have been locked out of the city development method. Since there is no real explanation for why the Arabs have been locked out of the process, I return to the primordialist-constructivist approach to explain it; the feeling of normalcy (or 'us') compared to that which is alien (or 'them') combined with the religious-ideological basis for the Israeli state explains this exclusionary approach to Jerusalem urban planning.

A crucial aspect of the urban planning problem in Jerusalem is that the Arabs are immobilized by taxation without representation: the Palestinians of Jerusalem pay taxes to the municipal government yet do not receive any of the public services that usually are associated with such payments.[54] This dates back to a time before Jerusalem's unification, when the master plan for the expansion of Jerusalem of 1964 displayed few detailed planning recommendations for improving living conditions or providing public services.[55] (Conversely, the westward expansion of the Jewish settlements enjoyed levels of

organization and efficiency that have now characterized Israeli public policies toward Jerusalem Arabs.)[56] The land use policy clearly ensures that Jewish areas receive development funds while Palestinian areas are restricted.[57]

Another problematic issue in Jerusalem urban planning is the distribution of municipal spending. Besides the expropriation of lands and exclusion from public political participation, Arab neighborhoods see "disproportionately low municipal spending," which "cements Jewish advantage."[58] Scott Bollens reports that there is at least an 8:1 spending ratio in Jewish neighborhoods versus Arab ones.[59] This budget discrepancy can be translated to infrastructure development, such as the issues that the Isawiye village experiences: poor roads, streetlights, schools, sidewalks, and parks, as well as a deficient postal service and water supply.[60] Inadequate access to water and poor sewage systems entails an environment that is lacking in basic standards of living and represents a truly imbalanced allocation of financial benefits to different ethnic communities. These gaps cannot be defended logically without the combined primordialist-constructivist approach to understanding ethno-geographic resource allocation. The sense of entitlement that comes along with being ethnically defined, combined with linguistic and religious commonalities, provides an emotionally compelling reason to provide more resources to one's own than to the "intimate enemies."[61] Moreover, the discriminatory policies are validated and reified by the discursive framework of the primordialist-constructivist lens, where rational choice and thought is outvoted by the emotional and ethnic appeal. The very systems that have been established to monitor urban planning ensure the primordialist-constructivist approach, since if the municipality is sympathetic to the Arabs, the Ministry of the Interior and other organizations can place pressure on the municipal government; therefore, the approach to excluding Arabs from the urban planning process is self-enforcing, as it works "to change the geographic and demographic balance."[62]

The body responsible for the imposition of these restrictions is the Israeli Jerusalem Municipality, otherwise known as the city government. They delay the construction and development processes in Arab Jerusalem because they use policies of reunification and classification, while also requiring Palestinian landowners to finance these policies.[63] Besides this, Arab landowners must complete this preparation process within a specified period to which Israeli Jewish landowners do not adhere. Arabs are restricted from utilizing local political power as well as the process of urban planning in its most basic sense. It takes roughly three years to prepare and approve a plan for a new Jewish neighborhood.[64] Conversely, it takes approximately ten years for a similar plan to establish an Arab equivalent; moreover, Arab neighborhoods are constricted in their architectural, aesthetic, and situational characteristics and thus are often replicas of one another, therefore making the delay even more absurd and illogical.[65]

The Municipality also monitors and restricts spatial relations in Arab Jerusalem, limiting the height of houses, the number of floors a building can have, and the distances between structures and roads.[66] Districts like Isawiye are limited to two-story buildings that are better suited for rural villages while neighboring Jewish district French Hill maintains eight-

story buildings, thus creating low density Arab housing.[67] (The rationale for the floor regulations is that Palestinians do not like high-rise apartment buildings[68]—a dubious statement at best.) "Hidden guidelines" exist to regulate Arab expansion, like "intentionally wide road standards that closed off development opportunities for rows of building lots consumed by the road"[69]; this practice limited building and improvements in Arab neighborhoods. However, for Jewish immigrants, public housing projects have allowed for upgrades and gentrification to better accommodate this select part of the Jerusalem population.[70] This partisan approach to urban planning and policy has made it so that "ethnic criteria overshadow functional factors in the distribution of urban benefits," though Israeli planners try to mask this[71], resorting to subtle spatial techniques to achieve Arab dispersion.

There are many methods that Israel has worked to divide land and resources unequally between Jews and Arabs in Jerusalem, though I have highlighted the most crucial ways that Israel has subtly altered resource allocation and land development in ways that have affected Arabs in their access to the most basic services and plans. The justification for this process is the combined primordialist-constructivist approach, adapted from Brown's conceptual languages of nationalism which provides the backbone for Israeli planning's partisan strategy in Jerusalem.

AMELIORATION AND ACCOMMODATION: MAKING URBAN PLANNING IN JERUSALEM EQUITABLE

Ironing the wrinkles of inequality in Jerusalem's urban planning system will not happen overnight. It will involve a series of reforms in the structural and social policies of the municipal government and a transformation of Israeli Jewish attitude toward Arab Jerusalem. In this section, I present the necessary mindset that would engender a more equitable urban planning system that addresses the multiplicity of issues, though I believe it to be somewhat unachievable considering the current situation. I will then also recommend urban policy and planning changes in Jerusalem to correct the economic and spatial imbalances.

The primary problem with the urban planning approach that Jerusalem's municipal government utilizes is self-affirming and primordialist-constructivist in nature. Thus, any rational thought about allocating resources, public services, land, or planning is pushed aside in favor of the more emotionally powerful ties to common ancestry, leading to an organically-derived nationalistic approach to urban policy. Any individual that does not share this common history or attributes like language, ethnicity, or religion cannot be considered an accepted citizen. Altering this mindset is difficult because the beliefs are so emotionally ingrained into the community. To make matters more complicated, there is a self-enforcing ghettoization that has occurred in Jerusalem, where ethnic and religious communities have preferred to stay within their own enclaves, further perpetuating the primordialist approach to urban spatial relations.

The ideal mindset for producing more equitable planning would incorporate policy decisions made solely on population size, cross-cultural and multiethnic concerns, and balanced financial support for the different communities. It is essential that any change in urban policy reflect an understanding of

the socioeconomic climate in Jerusalem. One should analyze the interactions between Ashkenazi, Mizrahi, and Ethiopian Jews before turning to the extreme imbalances between Arabs and Jews in terms of spatial resources. Otherwise, this mindset could veer into a "neutral" territory[72], one that is not actually neutral at all but instead culture-less and lacking context. A new urban strategy must work to unpin entrenched territoriality, aim for a reduction of exclusion, and allow more access to land and resources. The Jews, though with a claim to the land, must recognize the Palestinian ownership of land; ideally, a strategy to at least represent the populace would incorporate a commission with representatives from each major pre-existing district so that each representative can opine about the issues and concerns of each quarter. Since the establishment of the Israeli state, ideology and urban policy[73] have been intertwined and are virtually indistinguishable from one another. If the municipal government can make a better distinction in representing constituents' concerns to make planning more characteristic of the actual population, Jerusalem may urbanize and industrialize with greater ease.

Currently, to make any progress in obtaining resources or in building, Arabs must work within the discriminatory framework that the municipality has arranged. One aspect of urban policy that must be enforced equally is the law, which currently discriminates based on Jewish or Arab neighborhoods. Using explanations such as Palestinians' obvious dislike of high-rise apartment buildings is not a suitable argument to address why buildings in Jewish districts have not undergone the same regulations; it should be assumed that the Jews do not prefer high-rise buildings either. Furthermore, consideration of basic human needs and rights must remain at the forefront of the urban planning scheme. In 1997, Isawiye residents had on average three to five square meters of gross area per person because of the destruction of buildings and homes in this neighborhood.[74] (The national standard for low income housing at this time was twenty square meters of gross area per person.)[75] Such extensive housing and urban density issues must be addressed in an open forum with representatives and councils.

A potential way of handling a restructuring of the urban planning system would be to create a "tier of local municipalities,"[76] which is an arrangement that would split the Jerusalem's metropolitan area into quarters and townships, diffusing the conflict of centralization. (This could also potentially reduce the inefficacy of the top-down federal-municipal system of urban planning that characterizes Israel's existence.) Yiftachel and Yacobi, who present this alternative binational setting, believe that it would create blocks and neighborhoods to decrease tensions.[77] However, increased decentralization may actually hurt Arab Jerusalem since it will only serve to disunite the Palestinians even more. This decentralization has potential but must be developed with great detail before serious consideration since Jerusalem is already a city based on quarters, blocks, and neighborhoods; how will Yiftachel and Yacobi's plan differ? The plan also does not address whether or not communities will be shifted around or if they will remain in their current state, instead focusing on creating township governance within each district. However, their idea of funding the councils equally and reimbursing

the Palestinians for the constraints and regulations that have prevented them from living in Jerusalem with equal amounts of space and resources is important.[78] The problem is whether this will be set up internally within the Israeli system or if it will come about with a consociational-style commission, which will certainly define its real treatment of Arab Jerusalem.

As Bollens details, a revised urban policy in Jerusalem must reverse the ills of partisanship that has typified the city since Jews began immigrating to the city. It must avoid enacting laws and regulations *ex post*; reverse the absolute territoriality that Israeli political culture has nurtured; promote greater inclusion; de-monopolize access to resources, land, and space; and treat citizens as individuals as opposed to mere extensions of their ethnic groups.[79] These changes will distribute local political power more evenly and provide increased access for all constituents to policy-making, both directly and indirectly.[80]

An accompaniment to a reformed theoretical approach to urban planning in Jerusalem would involve revamping the infrastructure of Jerusalem. Though housing development certainly needs to improve in Arab Jerusalem to accommodate the burgeoning population[81], other physical and spatial considerations must be addressed as well. One such issue is that of transportation infrastructure; linking towns and cities across the greater Jerusalem area, especially if districts and neighborhoods evolve into local municipal planning councils, will be important in fostering transmission of people, policies, and ideas. A reevaluation of road and street networks should allow for increased land use and housing development in Arab Jerusalem, while also connecting towns based on currently unaccounted for actual patterns of human and resource transit. Transportation and spatial infrastructure for transit ought to be mainstay for urban planning that is based on realities, not ideologies.

A warning for this new frame of mind for urban planning and policy, however, is to avoid the reductionist mindset of looking only at the various communities' commonalities and make assimilation the only acceptable social policy. These communities have lived in relative self-enforced segregation for years because of perceived differences. While education and cross-cultural communication can reduce this perceived 'otherness,' it is important to realize that these preconceived beliefs have prevailed. Instead of ignoring this and implying that all communities are similar or identical, urban planning must consider each community's individual needs depending on the demographics, economic status, and necessities of each district and neighborhood. The goal of urban policy and planning, therefore, should not be assimilation but accommodation.[82] In this sense, social understanding and communication may be more important than methodology. The attitude must precede the action in Jerusalem's urban planning.

CONCLUSION

Jerusalem, as the Holy City for the world's three major monotheistic faiths, is precariously managed, with an entire population of people facing discriminatory policies and legal action because of an emotional and ideological approach to politics. This approach, which I call a combined primordialist-constructivist method[83], is exclusionary based on ethical and

ethnic factors. Though not usually outright discriminatory, the Israeli government and the Jerusalem municipality have enacted policies and laws that effectively bar Arabs from participating in the policy and planning process. This is combined with a subtle move to expropriate land and space under the belief that all of Jerusalem is "an 'eternal, indivisible' part of Israel."[84] Such ethnocentric and primordialist thinking fails to promote any equity across the city's neighborhoods.

Future considerations for urban planning in Jerusalem must address the imbalance of financial transactions, available resources, public services, and housing development for its communities. Such change and consideration must be preceded by a change in social understanding and communication, lest these changes occur under the Israeli primordialist-constructivist mindset; this would only lead to increased repression of the Palestinians, decreased government transparency and accountability, and an absence of representation. The potential for future development in Arab Jerusalem may in fact serve as a model definition for the bulk of Israel's policies toward Palestinians. Arabs must be able to reappropriate their land, their dignity, and their identity, which can only come about with cooperation and accommodation between the various communities in Jerusalem.

REFERENCES & NOTES
1. Tovi Fenster, "Separated Spaces - Shared Spaced in Jerusalem Today," Treballs de la Societat Cataland de Geografia 56 (2003): 68.
2. Though the issues of zoning and spatial arrangements in Jerusalem have existed for hundreds of years, I have limited myself to the 20th century, focusing on the events following the establishment of the Israeli state. Urban planning throughout the centuries has changed and would be too much to attend to in the space allotted.
7. Ibid., 34.
8. Michael Dumper, The Politics of Sacred Space: The Old City of Jerusalem in the Middle East Conflict (Boulder, CO: Lynne Rienner, 2002), 8.
9. Ricca, 36.
10. Rassem Khamaisi, "Jerusalem/Al-Quds Between Two Walls: The Urban Planning Strategy and Policy for Reaching Hegemony," in Gulf First Urban Planning and Development Conference & Exhibition (Kuwait City), pdf p. 11.
11. Ricca, 39.
12.. Ibid.
13. Dumper, "Israeli Settlement in the Old City of Jerusalem," 37.
14. Ricca, 48.
15. Dumper, The Politics of Sacred Space: The Old City of Jerusalem in the Middle East Conflict, 17. The Status Quo agreement of 1852 divides ownership and maintenance of Christian holy sites in Jerusalem but has also come to include some Muslim monuments, though only in an informal agreement.
16. Ricca, 54.
17. Ibid., 51.
18. Ibid., 197.
19. David Brown, "The conceptual languages of nationalism," in Contemporary nationalism (London: Routledge, 2000).
20. Ibid., 6.
21. Ibid., 20.
22. Elisha Efrat and Allen G. Noble, "Planning Jerusalem," Geographical Review 78, no. 4 (Oct. 1988): 390.
23. Ricca, 83.
24. Ibid., 73-74.
25. Fenster, 73-74.
26. Ricca, 33.
27. Fenster, 74.
28. Ibid.
29. Ricca., 87.
30. Ibid., 85.
31. Ibid., 162.
32. Ibid.
33. Ibid., 175.
34. Ardi Imseis, "Facts on the Ground: An Examination of Israeli Municipal Policy in East Jerusalem," American University International Law Review 15, no. 5 (June 2000): 1051.
35. Scott A. Bollens, "Urban planning amidst ethnic conflict: Jerusalem and Johannesburg," Urban Studies 35, no. 4 (April 1998): 733.
36. Ardi Imseis, 1044. In 1967, "the Israeli government enacted the Municipalities Ordinance (Amendment No. 6) Law, which authorized the Interior Minister to unilaterally enlarge the municipal boundaries of East Jerusalem 'at his discretion and without an inquiry' into any impact it may have on the indigenous Palestinian populace." This further indicates the purpose with which the Israeli government sought to establish its Jewish settlements while displacing the Palestinians within the legal framework.
37. Bollens, "Urban planning amidst ethnic conflict: Jerusalem and Johannesburg," 733.
38. Fenster, 69.
39. Ibid., 71.
40. Ibid., 73. "The total number of permits which were issued between 1967 to 1999 is 2950 when the Palestinian population grew from 68,000 to 180,000, which means that out of the total 19,650 Palestinian homes built in East Jerusalem after 1967 war, 16,700 do not have permits and therefore are considered as illegal and face demolition threats and heavy financial fines."
41. Ibid., 71.
42. Khamaisi, 12.
43. Ibid.
44. Ibid. "The green areas, which do not serve the local Palestinian residents, are used as a means to limit Palestinian civil development."
45. Ethan Bronner and Isabel Kershner, "Parks Fortify Israel's Claim to Jerusalem," The New York Times, May 10, 2009, http://www.nytimes.com/2009/05/10/world/middleeast/10jerusalem.html (accessed May 10, 2009).
46. Khamaisi, 12.
47. Sarah Kaminker, "For Arabs Only: Building Restrictions in East Jerusalem," Journal of Palestine Studies 26, no. 4 (Summer 1997): 9.
48. Bronner and Kershner.
49. Ibid.
50. Ibid.
51. Fenster, 75.
52. Ibid., 67.
53. Ibid.
54. Ibid.
55. Efrat and Noble, 398.
56. Ibid., 397.
57. Khamaisi, 11.
58. Bollins, "Urban planning amidst ethnic conflict: Jerusalem and Johannesburg," 735.
59. Ibid.
60. Fenster, 75.
61. Bollens, "Urban planning amidst ethnic conflict: Jerusalem and Johannesburg," 733.
62. Khamaisi, 5.
63. Ibid., 13.
64. Kaminker, 8.
65. Ibid.
66. Khamaisi., 14.
67. Kaminker, 10.
68. Ibid.
69. Bollens, "Urban planning amidst ethnic conflict: Jerusalem and Johannesburg," 737.
70. Amiram Gonen, "Widespread and diverse neighborhood gentrification in Jerusalem," Political Geography 21 (2002): 729.
71. Bollens, "Urban planning amidst ethnic conflict: Jerusalem and Johannesburg," 745.
72. Bollens, "Urban planning amidst ethnic conflict: Jerusalem and Johannesburg."
73. Scott A. Bollens, "Urban Policy in Ethnically Polarized Societies," International Political Science Review 19, no. 2 (1998): 191.
74. Kaminker, 13.
75. Ibid.
76. Oren Yiftachel and Haim Yacobi, "Planning a bi-national capital: should Jerusalem remain united?," Geoforum 33 (2002): 142.
77. Ibid.
78. Ibid., 144.
79. Bollens, "Urban Policy in Ethnically Polarized Societies," 192.
80. Ibid., 193.
81. Edward W. Said, "Projecting Jerusalem," Journal of Palestine Studies 25, no. 1 (Autumn 1995): 8. The Palestinian population "doubled from 70,000 in 1967 to about 150,000 in the early nineties." Despite this, the Palestinians could build on "no more than about 10 percent of the land."
82. Scott A. Bollens, "Urban planning and intergroup conflict: Confronting a fractured public interest," Journal of the American Planning Association 68, no. 1 (Winter 2002): 36.
83. Adapted and altered from David Brown.
84. BBC News, "Jerusalem settlement 'extended'," BBC News, April 27, 2009, http://news.bbc.co.uk/go/pr/fr/-/2/hi/middle_east/8020825.stm (accessed April 27, 2009).

National Identity: A Macanese Cultural Study

Caroline Bernal-Silva, 2011
Department of Anthropology

A Macanese Cultural Study is one that focuses on the Portuguese community residing in Shanghai since the late-1800's and its subsequent displacement in the mid-1900's. The initial research for this project was sparked by conversations with my own relatives, and the realization of my lack of knowledge about my family heritage. My father, Michael Ronald Bernal-Silva, originally Miguel Reinaldo Bernal da Silva, was born in Macao, a former Portuguese colony. Macao is a peninsula off the coast of Mainland China; it lies on the Western side of the Pearl Delta with the Guangdong province to the north and the South China Sea to the south.   I always knew my father was an immigrant, but I never thought twice about it, at least not until recently, when I took a class on War and Migration. I began learning about the devastating trials and tribulations many immigrants encounter, in either refugee or internment camps, and then through their displacement. As I read more on immigration, and watched films elucidating the shocking reality of war, relocation, and resettlement, I began to think of my own family. I began to wonder about their immigration, their life back in Shanghai, and how difficult their displacement to America must have been. What truly incited and propelled my curiosity through was the 2010 Census form. That insidious little box that one needs to check in order to encapsulate one's most likely vast heritage made me stop and wonder, "What do I check? Am I Caucasian, because I look white? Am I Portuguese, because that's what my name implies? Or am I Chinese, because my father's family emigrated from China? With these seemingly simple questions swirling through my mind, I set off to find the answer.

To begin this study, and in order to best understand the Bernal-Silva history, one must understand three main points. First, one must be aware of the history of Portuguese migration to China in the 16th century. During the 1400's and into the early 1600's, Portugal experienced a surge in wealth and power due to its new maritime trade routes. In order to elaborate on this wealth, the Portuguese began to fund expeditions around the world, which included those to the East. Portuguese merchants settled in Macau and controlled most of the trade between China and the West.

The next pivotal moment in Macanese history came in the 1840's when China fell to the United Kingdom during the First Opium War and was forced to sign the Treaty of Nanking. With this, Shanghai, due to the stipulates of the Treaty of Nanking, opened its doors to foreign concessions, and soon a Portuguese community began to take root in Shanghai. According to Aurea Meyer, our resident family historian, to add to Shanghai's growing Portuguese population, between 1843 and 1900 about 2,000 Portuguese passport holders from Macao and Hong Kong migrated to Shanghai, thus adding to what would soon be known as the International Concession of Shanghai. Then in 1860 when China lost in the Second Opium War, she conceded to open more ports to foreign nations and permitted a French settlement in Shanghai "named the French concession". Later other foreign nations settled in Shanghai and lived in either the French or the International settlements. The concessions included mainly the British and French, but as the years went on other communities began to grow, including the Portuguese, Dutch, and Americans, and soon an International settlement developed as well. With this migration and subsequent settlement, our story of the Macanese community in Shanghai begins to take shape.

As the city entered the 1900s, it rapidly became one of the most decadent cities in the world, and many would refer to it as the "Paris of the Orient," but not everyone in Shanghai experienced its luxury. As historian Stella Dong explains,

In Shanghai's prime, no city in the Orient, or the world for that matter, could compare with it. At the peak of its spectacular career the swamp ridden metropolis surely ranked as the most pleasure-mad, rapacious, corrupt, strife-ridden, licentious, squalid, and decadent city in the world.[1]

This excerpt is especially important to recognize, because it sets the stage to understanding the cultural essence of the Macanese community, which is both frivolous but giving. While this paper was in its beginning drafts, I asked various family members to read it and give me their uninhibited feedback. In sending it to Aurea Meyer, a distant cousin and active member in her Macanese community, and who is, as I said before, "our family historian", explained that:

Actually, this excerpt has little to do with the Macanese

My Grandmother (right), her sister Lillian (left), and my father Miguel in Hong Kong (1952)

community in Shanghai. The decadent city of Shanghai here can be compared to the boomtowns of the old West in the USA. It was lawless in that China had no jurisdiction over the foreigners and foreign nationals could do anything they pleased. The British were the top dogs and China had to concede to their opium trade in China.

The small Portuguese community from Macao lived in a narrow corridor that lay between the opulence of the foreign victors and the squalor and misery of the conquered and impoverished Chinese and survived the depression and several upheavals. The British, the French, and other foreign nationals liked to employ the Macanese who were loyal and hardworking, took pride in their work and had a facility for languages. The Macanese or Portuguese did not have their own concessions because China did not concede anything to them. They were not in the war against China. They just hung on the coat tails of the foreign victors and earned a living in a supporting role as accountants, translators, bodyguards, office managers. Few in the Macanese community owned property and most lived from hand to mouth. Socially, they stuck to their own. The Macanese in Shanghai were frivolous and giving perhaps because frivolity was a way to survive and giving was easy when everyone had so little; besides, giving made one feel awful rich.

Mrs. Meyer's description is incredibly important to understand when studying Shanghai's concessions and the Portuguese community that resided there. There was clear opulence and luxury in Shanghainese culture, but those characteristics are merely surface definitions of Shanghainese culture in the early mid-1900s. Their 'extravagance' simply is one element in the complex dynamics that Wong speaks to in her book. In studying the Macanese culture and reading Aurea's description, it is clear to me that there is more to say about their frivolity as a cultural element rather than a gluttonous sin.

Secondly, it is important to understand the history of Macao, a Portuguese settlement off the coast of Mainland China. Macao has been a Portuguese port since the mid-1500s, and although it was not always owned by Portugal, it has always been ruled by the Portuguese government - that is, until 1999, when it was returned to China. For this reason, Macao's population is prominently Portuguese and Chinese. In fact, much of the

culture today is a mixture between the two ethnicities. Macao, fortunately, belonged to Portugal during the numerous wars that China underwent in the 20th century. During wartimes, Macao acted as a refugee camp for the Portuguese, saving them from internment and concentration camps and unjust displacements.

Thirdly, and most importantly, one must recognize that a Macanese Cultural Study is a complex look into a community whose very culture and identity is rooted in world politics, war, and displacement. Thus, the Macanese culture is not a self-defining description of this particular community. Rather, it seems impossible to categorize this group of people into one definite and traditional nationality. As I said before, the word Macanese does not, in any way, truly define this community; rather it is the most inclusive definition possible. Many members of the community do recognize themselves as part of this transcendent kinship, but as the century progressed, the community lost a dominant nationality. Today, much of the community can also be categorized as Portuguese, Eurasian, Filho Macaos, Sino-Portuguese. Most members have acculturated to their country of displacement and are now also American, Canadian, Brazilian, etc. The definition of Macanese is a broad label, and not a true definition of their ethnicity and nationality.

As I began to study the community, what I found most unique was their idea of national identity. They are a community whose identity lies within kinship and familial relationships, and not a clearly defined nation. For this reason, I believe they are an imagined community, a people that are socially constructed, rather than geographically bound. The community also seems to be one that has fallen between the cracks of history and suffers from a major lack of historical documentation. Again as Aurea Meyer explains, "much was done with a handshake; the Portuguese traded without documentation." Although, in the last ten years the Macanese population has begun a program not only to further Macanese historical studies, but also to create a stronger national identity. This movement for a stronger Macanese nationalism does include the history of the Portuguese people living in China from the 19th-20th centuries, but, unfortunately, is more focused on the population living in Macao today. The Macanese culture and history that this paper will outline is one of a generation of immigrants that is dying out, and today the youngest in the community are approximately 70 years old. One historian, Antonio M. Pacheco Jorge da Silva, who was recently commissioned by Macao to study the Portuguese Community in Hong Kong, provided a great collection of family names, major community events, and historical outlines. Unfortunately, Jorge da Silva's work was merely a baseline account and collection of the community.

So, despite a few great resources, the information on the Portuguese community in Shanghai during the first half of the 1900s is relatively non-existent. As a result, while I conducted my research I found little documentation on the community, and much of my information comes from participant observation, interviews and surveys, Facebook groups, online genealogy sites, and numerous emails.

With this basic cultural and historical context, I then set out to find a purpose for my research. I muddled through endless interviews, various family parties, and numerous

books, and discovered was a modern understanding of my personal definition of self-identity, ethnicity, and nationalism. I am American first and foremost, but I find comfort in my Macanese ethnicity, which includes a family and a community that, despite war and relocation, has stayed connected mainly through modern globalization and new technologies, which enable contact with each other despite their geographical location. Thus, the Macanese are a community that has proven to transcend time and place. Unfortunately, I am not a part of this great history; I am its aftermath. I am a second generation Macanese-American, but I feel no tie to Macao, its history, or its people. Though this is not to say the Macanese culture did not have a great impact on my life. By studying the culture, I have found a greater appreciation and understanding of my own close-knit family. Through my Macanese grandparents, I have developed a great sense of family, a profound sensitivity, and the courage to persevere through anything. All are Macanese characteristics that I hope to elucidate throughout this paper.

Since my grandfather carried the Bernal-Silva name, but unfortunately died in 2004, my main informant has been my grandmother. Evelyn Theresa Danenberg Bernal-Silva, or Girlie as I will refer to her throughout the rest of the paper, will act as the outline and backbone of this study. This paper and subsequent film are an ode to a woman who, in spite of her difficult life, has managed to survive and thrive in America.

Girlie was born on December 21, 1929 in Shanghai, China to Cesar Augusto Danenberg and Zelinda Emilia Gomes, themselves both born in Shanghai at the turn of the century. The Danenberg's are a Dutch family who lived in China since the mid-1700s until they were forced out during the Communist invasion in the 1950s. Through marriage and kinship relations, the Danenbergs joined the Portuguese concession in the early 1900s.

In China the Danenbergs, although middle class, lived "extravagantly." Girlie claims her family lived a luxurious life in Shanghai. In Shanghai each international community had its own club where children could play together, teenagers could have dances, and adults could throw parties or simply get together to play cards. There were always events to attend and people to visit. These are the times my grandmother loves to remember, and these are the times that truly define her beloved Shanghai. The early 1900s was a time of sumptuousness for some, but not all of Shanghai lived in this splendor. China's society was split into clearly defined classes, and in the international concessions most Chinese entered as laborers, whose life's luxuries were far from the conditions of people they served.

My grandmother remembers a time when she had a Chinese maid, or amah, to tend to her every need. But this extravagance was not without its caveats, "Although many believe that the amahs were merely maids or servants, many times they became part of the family." My grandma explains that it wasn't wrong to have amahs because it was their way of providing an income to those who needed it. She also explained that many of the amahs became part of the family because they had no other family. Many of the 20th century generation were raised by their baby amahs, and this is probably how the Chinese culture crept into the international settlements: "The qualities of the Chinese were being passed onto the children they looked after".[9] Although the amahs were in many cases welcomed into the families, they usually had families of their own living miles away. Their children worked on the farms alongside their fathers, while their mothers (the amahs) worked and lived in the cities. Although, as Mrs. Meyer explained to me, many amahs "were young girls who left the countryside to work in the city; most almost never returned to their rural homes after they start working in the city". Those amahs that did have families saw them about once a year, or even less in some cases. This class distinction intertwined with the acceptance of the Portuguese community is just one aspect of what Stella Dong mentioned in her book, Shanghai: The Rise and Fall of a Decadent City. Shanghai's decadence was only experienced by the upper class, while the lower classes, such as the amahs and rickshaw drivers, were 'strife-ridden'. I believe this reality of the laborers in the foreign concessions and their seemingly close relations with the people they served greatly added to the Macanese culture; which, as I have experienced first-hand, is one of kindness and acceptance.

During this time, the Macanese community believed in an "open door policy", in which anyone was welcomed into one's home. Many times, my grandmother recalls, people would just show up at the door and were welcomed with open arms. The Macanese women, and their homes, were always ready to host people. It is said that in a Macanese kitchen, there was always Macanese food made and ready to be served, which I can attest is still true today. Food was, and is, the center of Macanese culture. Today, and from what I gather in the early 1900's, Macanese food is a fusion of the West and East. It is a mixture of their Portuguese heritage and their Chinese surroundings. My personal favorites include Macanese staples such as batadada, "a potato cake that uses ingredients from East and West (coconut and potatoes). Minchee, which is "ground beef/pork cooked with onions and diced potatoes and thick soy sauce (dik yau)." , is hardly haute cuisine, but Filho Macs consider this one of our national dishes."[6]

My grandma explains that "if you invite five people over for dinner, be prepared for at least fifteen. There is no such thing as a small gathering." Communal living is key to the Macanese tradition. I have come to believe that this tradition is what kept the community so close, even through their displacements in the second half of the 1900's.

In Shanghai, Evelyn, her two sisters Gloria Maria and Lillian Margaret, attended Catholic school run by the Sisters of Loretto, an order founded in America. While her brother Francis Joseph attended St. Francis Xavier, a French school, whose exams, interestingly enough, came from London. Thus, the Danenberg children, as well as many other children in Shanghai, were educated in the English language. Actually, most living in the international settlements spoke mainly English, some their individual languages, as well as bits and pieces of various other dialects. The schools, just as the languages, were a mixture of ethnicities, and thus were microcosms of the international settlement. Many of the people I have met and interviewed all agreed that there was no racism in the concessions - a common life was shared in the streets and resulted in tolerance and acceptance, another key aspect to Macanese culture. According to my grandmother, the only thing that the Macanese were intolerant of was entitlement:

The Portuguese community stressed on pride and earning wages by hard work never complaining as they considered it their jobs. As my father used to say, you earn your money by proving that you are a good worker and never depending on anyone to support you. Pride in your work is most important so you can hold your head high and say "I earned my wages through hard and honest work".

This mentality is what I believe saved the lives of the Macanese community in the impending wars and relocations it endured in the mid 1900s. Unfortunately, starting in 1927, this unique society fell subject to raging world politics, and its residents were forced to face the harsh realities of war, displacement, and immigration.

In 1937, the lives of the Macanese community in China were temporarily uprooted due to the Chinese Civil War, which raged between the Chinese Nationalist Party and The Communist Party of China. During war times, "The Portuguese women and children were sent to Macao, while the men stayed behind. This only lasted for a short time." Girlie explains, "We were young and enjoyed ourselves thoroughly swimming on the island of Taipei and Coloane. After a short time we went back to Shanghai". The struggle between the two political factions left the country in the middle of major political unrest and upheaval, most of which did not reach Shanghai and its international settlements until the mid-1900s. World War II and the Japanese invasion interrupted the escalation of the civil war between 1941 and 1945.

During World War II, Shanghai was torn apart by the Japanese invasion. During this four-year period, the British and Americans living in China were placed in concentration camps. Furthermore, all the foreign banks and companies were closed, leaving no jobs and subsequently no income for citizens of the neutral countries. Since Portugal was neutral, the Portuguese living in China were given almost no place of refuge. In order to ensure their safety, many of the Portuguese living in China during the war fled to Macao. Macao at the time was "a small enclave of 23.5 square kilometers, with virtually no resources, Macao is totally dependent on outside sources for basics such as food and water". Also, with the arrival of refugees, "the population growth brought a new set of problems for the settlement. Instances of crime and unrest rose in the overcrowded districts. And where fragile, temporary mat sheds huddled against the walls of the older buildings fires became common".[9] My grandmother, however, did not endure the trials of living in Macao during WWII. She and her family were able to travel to the English settlement in Shanghai due to familial connections. She recalls,

The Japanese took away Portuguese jobs and money. We had to move out of our House and Thank God, my uncle had a big house in the English settlement in the countryside and gave us each a room. My father and a few of his friends pooled whatever money they had and opened up a small jam and peanut butter factory, it had enough to buy some bread and the bottom of the barrel peanut butter and jam which would be spread thinly on our two slices of bread per day. Then the factory closed down as there were not enough people who could afford to buy the jam and peanut butter. We were then down to eating "cracked wheat" with a couple stalks of cabbage & later on when that got too expensive, we ate millet (bird food). But through all that we were happy. My Uncle's house had a gated lane, where all the families had their own little coal/wood stove cooking food outside. We would all try to guess what each was cooking. If there was any meat/chicken/fish in any of the stove, it would have been a miracle but funny thing I remember we were always laughing and singing as one cousin played the mandolin, one the guitar, one the ukulele and my mother and her cousins would harmonize.

We being young (eleven years old) thought nothing of it but, of course, we were hungry but that didn't stop us from having fun as there was a huge park (Jessfield) a few blocks away where we could slide down the hills. In winter we would go out and ski with our worn down sneakers and got severe 'chillblanes' for our effort. Let me tell you that was painful. Thank goodness my father was a sort of home-bred doctor and would wash our feet with peroxide. He even pulled my rotted tooth out as he would loosen it each day and gradually it came out so I presume, you could refer to us as survivors.

After the 1937 war many of the refugees, including my grandmother and her family, returned to Shanghai. In 1945, after massive bombings and poverty, life in Shanghai returned to 'normal', and its inhabitants were able to resume the lifestyles which they were accustomed to. Despite the return to 'normalcy', Shanghai experienced many changes between the years of 1941-1945. One major change was that the American Military entered into Shanghai and opened up military bases. They recruited many Portuguese to work for them, including my grandmother. My grandmother and a few of her friends were secretaries for the American army in Shanghai, where she explains, "We would be picked up in Weapon Carriers and transported to work on the Army bases."

The social scene of Shanghai that my grandmother loved so much began to flourish once again, and in 1949 Girlie began to date Alvaro Albuquerque Bernal da Silva. Alvaro and Girlie belonged to the same social groups, and often ran into each other at gatherings such as at the Portuguese club, Club Lusitano of Shanghai, the Race club, and the YMCA. Girlie explains,

I was only then seventeen years old and he asked me to dance while my parents sat above at the dinner table watching. He later asked me for a date but then again we were both going out with others and did not seriously date until I was nineteen. We went out now and then and he would say I was too young as he was 6 ½ years older than me. Besides he was very much a ladies' man and was dating many Russian girls (which was all the craze at that time).

But her moment of bliss was short lived. As historian Jill McGivering explains in her book, *Macao Remembers,* "mainland China was in the grip of political fervor at the time, in which anti-Foreign feeling was strong and the conditions were ripe for angry pro-communist uprisings".[8] Thus, soon after their courtship began, the Civil War underwent a major power shift and the communists invaded Shanghai. My Grandma explained that on the first day communists took over, they marched into her place of work and: "They made me and all the other people in the office get up and go out to the main square, there were many people there, there was a man in the center, and they just shot him, right in the head. Disgusting. [The Communists] were cruel people and they definitely did not like foreigners."

For awhile Girlie and the rest of the 'non-Chinese' in Shanghai lived in constant fear, wary of Communist power. To them, foreigners meant nothing and they knew the communists would not think twice about making an example of them. My

grandmother can remember when she was seventeen,

I was working for an Auto-Company at that time and they just came and took over the place. We had to go to meetings every morning. One day I decided to take the afternoon off and go swimming at the YMCA but when I got home to change, Grandpa (her father) was there and refused to let me go as he was afraid the Communists at my workplace would find out and really punish me somehow.

Another informant and distant relative, Oscar Collaco, describes the Communist takeover as,

An overnight transition, very quiet and with no fanfare. When I left the house to attend school that one morning, as I exited the residential compound, I saw that there were mostly uniformed soldiers lined up on both sides of Avenue Joffre. Many sitting on the curb resting, which may have been a very long trek for them marching from the North of Shanghai to be stationed on all the main streets of the City. Wow! So many of them, that I suspect that many Nationalist turncoats may have stripped and discarded their uniforms to join the invading band along the way.

Soon after the communists took over Shanghai, all foreigners, for fear of persecution, began to leave in droves. The foreigners were allowed one trunk per person and just enough money to pay for their travels out of Shanghai. Since Girlie's father, Cesar, was an employee of the Charter Bank, a London-based bank with a major branch in Hong Kong, they were able to move the family to Hong Kong. My grandmother does not remember much about their move, but knowing what it must have been, it is understandable that she does not remember. From what she can recall, she explained, "We traveled first by a dirty rattling train which rocked and rolled all the way to Tientsin, where we stayed a couple of days. Then from there we boarded a dirty/ smelly little dinghy to Hong Kong, I was so sick…. I think we puked the whole way". After a week or so of traveling the Danenberg family landed in Hong Kong in 1949.

Oscar Collaco, who also traveled to Hong Kong at the same time, recalled his journey differently than my grandmother,

So, with much instigation and prompting to my Dad, our family applied to leave for Hong Kong. There were no more trains. My Dad finally booked the five of us) on a small English steamer, the last one to exit Shanghai for a four days sailing to H.K. As we passed the island of Taiwan, timing a night passage through the Straits of Formosa, the ship had to extinguish all the lights in order not to be blasted out of the water by the Mainland Communists. It was quite an experience arriving at the HK harbor in July. Hot and humid; but, all was well when we saw aunties Mary and Margarida, Uncle 'Bones',

We thank God for bringing us through so nicely. We heard many rough stories from our relatives who traveled by train. Those families with young children, being crammed into hard wooden seats, alongside their packed belongings or placed on top of them; and, those standing were shoulder to shoulder with the rest of the tired and hungry passengers fleeing the mainland. Food & water had to be brought on your own; toileting was done, at best, where you were. Everyone had to accommodate one another in this.

Although my Grandmother had landed in Hong Kong safely, she was separated from my grandfather. Alvaro was unable to move to Hong Kong because he did not have the proper paper work, so instead he was forced to move to Macao,

only a two-hour boat ride from Hong Kong. Macao acted as a safe haven for Portuguese refugees under persecution from the newly powerful Chinese Communist party. According to Historian Steve Shipp, author of Macao, China, "refugees fleeing Communist China were able to move easily into Macao, some choosing to live permanently in Macao and others living there while arranging to move in to Hong Kong".[11] Soon after Alvaro landed in Macao, Girlie quickly followed. "When I left Shanghai with my family Al and I were not yet married. Therefore I had to go to Macao to get married." She gave birth to her eldest, my father Miguel, on June 9, 1951 at St. Januario Hospital. They stayed a little over a year in Macao, a surprisingly pleasant year according to my grandmother.

During this time, the peninsula's refugee buildings were split up into units in order to house the Portuguese fleeing from the threat of communism. Since my grandmother knew the person in charge of sectioning off the housing units, they received one of the bigger units for just the three of them. "Everyone was so jealous, those poor people cramped into small spaces, with up to six people, can you believe?" Despite the obvious hardships of her displacement, Girlie described her experience as 'Fun.' "It was like a social club where everyone knew each other and during the evenings we would wait for Chinese food carriers to come; it was just like a picnic." Although Girlie felt that the experience was almost enjoyable, not everyone held the same sentiments. Since Girlie's father lived in Hong Kong she had the ability to travel to and from Hong Kong, where she could receive proper healthcare and other needs. Also, she was not psychologically traumatized by the refugee camp entrapment or uncertainty; she was merely buying time until Alvaro could move to Hong Kong too. Her transition was eased since she was not completely separated from the rest of her family and saw them frequently when she traveled to and from Hong Kong.

After a year in Macao and through the help of Catholic nuns, my grandfather received a painting job for American soldiers in Hong Kong. This job allowed him to travel and to live in the city. Once there he applied for work at the Hong Kong and Shanghai Bank, where he eventually would receive a job. While living in Hong Kong, Girlie and Al welcomed four more children: Ricardo, Christine Ann, Marie Therese, and Anita Cecile.

The Bernal-Silva's lived in Hong Kong for six and a half years, but life in Hong Kong was difficult and the family was struggling economically. These hardships were also amplified by the growing communist fervor in China. Luckily for my grandparents, the American Catholic Relief Center in Hong Kong appealed to the United States Congress on behalf of the refugees in Macao, and eventually their small community was allowed to immigrate to America. As Aurea Meyer explained to me, "they were allowed to migrate because the Shanghai Macanese were uprooted from Shanghai and relocated to Macao after the Communist took over in 1949". Also, to ensure safe passage, the American Catholic Relief Center loaned my grandparents money to cover the cost of their travels. This amazing act of kindness saved their lives but did not come without strings attached. They were to pay back the Catholic Relief Center in full. In addition, in order to gain admittance into the U.S, they were forced to sign an affidavit that stated, "They would not and could not become dependent on the state."

This agreement, although adding to their sense of pride, made starting a new life in America more difficult.

The Bernal-Silva clan left Hong Kong in 1957 on the *USS President Wilson* with about half of the Shanghai Portuguese community. The other half traveled on the *USS President Cleveland*. Oscar Collaco's account on the immigration process is very helpful in understanding the community's displacement and the political reasoning for the Refugee Act, which saved many of their lives.

In April 1957, my family immigrated to the United States because of the October 1956 street riots and anti-foreign sentiment in the Colony. My family applied under the Refugee Act, as we lived under the Communist regime in Shanghai since their take over from the Nationalists in 1949. The Chinese authorities gave us 9 days to settle our affairs, and to be out of the city. We gave all our remaining belongings and furniture to the kind and loving Amah who served us so faithfully for many years. If the Amah had any success in removing any item(s) from the apartment after we were gone is unknown. Because under the watchful eyes of the resident caretakers and watchmen of the apartment, who could claim that the foreigners have departed and have abandoned all that they left behind in the apartment; and whatever property that had also been left behind, should rightfully now be considered to be the property of the Chinese government, and no one could remove any such property without their say so and consent.

Once aboard the ships, all families were to be separated - men and boys were on one side of the ship while the women and girls on the other side. They were put into small cramped rooms set up like dormitories, with a couple of bunk beds in each room. When I asked about her experience, my grandma joked that, "Auntie Lilly and I were constantly sick, sailors we were not. Grandpa, on the other hand, had a great time, gathering with all his friends in the social area and leaving Mike and Rick on their own. They were only five and six!" Although, I assume that a trip of this measure could only be bittersweet, my grandmother's account of the immigration was comical,

On board the ship, I can recall the first time we saw a washing machine and dryer, so Auntie Lilly and I did our wash and then put the clothes into dry, but when we took them out, the clothes had shrunk to doll size… we were sad and had limited clothes but it was hysterically funny.

Even though I did try to dig deeper into the immigration process and their journey from Hong Kong to America, my grandmother gave me little information of their hardships. I can attribute this to her pride and her uncanny ability to always find the silver lining. However, I can remember hearing stories from my dad recalling what he remembers. He said he would run wild because my grandfather was not watching him and had a couple of "near death experiences." He recalled that "One day we were out on the lower deck playing, me and Rick, and we got caught in between two big steel doors and they almost closed on us, we were in big trouble, because Grandma saw us from the other side of the ship". Although I did not uncover many stories of their migration from China to America, I can only imagine what it must have been like for my grandmother, who was constantly sick in a cramped room, taking care of her small children.

They made several stops on their voyage - first Japan, then Hawaii - before finally landing in San Francisco,

where they went through immigration at Angel Island. My Grandmother can remember:

"The Employment Agencies in San Francisco were going full steam in recruiting people for jobs. They thought we were all really poor refugees with no clothes, etc. so they had racks of clothing, shoes… to send prospective employees to various companies. It was amazing everyone was hired almost on the spot."

Then after two weeks in San Francisco, they continued their journey to New Jersey by train.

We left San Francisco to go to New Jersey to meet up with my sister Gloria (Googie) who we had not seen in ten years due to the fact that she married an American sailor in 1947 who then was working in New Jersey and then within a year, his office transferred him to California. I guess life works in mysterious ways… we couldn't afford to go back to California, que sera, sera.

"On the train we had a room with a sink and a toilet in the center of the room in full view of everyone, not even a drape! And all we had were a couple of bunk beds and the boys (Mike and Rick) made the trip interesting to say the least, those angels." Despite the long and hard trip the family finally made it to Penn Station, and "Upon arrival at Penn Station, we were shocked and disappointed as we, literally, expected to see the road paved with gold." Although I found this statement incredibly amusing, it is hard to discount its irony. They expected a better life than the one they had in China - a life free of war, persecution, and racism due to the fact that they were not pure Chinese; but in America, what they found was a life that was plagued by neighborhood wars, social persecution, and constant racism because many believed they were 'Chinks.'

Once in New Jersey, they had a hard time finding a house. "Who would rent to a China woman with six kids?" After being conned out of money by multiple landlords, who used their immigrant status as leverage to steal their meager finances, and after various loans from family members and hard work, in 1965 they finally found a house of their own; which my grandmother still lives in today. Even though they had a roof over their heads, life in America was far from easy. Both Girlie and Al worked long hours on top of taking care and raising six children, all the while constantly dealing with ignorance and racism. Throughout my interviews, my grandma recounted many of her experiences with racism, but two stories of prejudice that particularly stood out to me were:

I went to work as a legal secretary, and I had a nasty supervisor, she did anything to make me fail, she would show me nothing ,I had to stay way over time and teach myself everything, I got it though and in no time I was the best secretary. The worst of it though, was no one thought we could write or read and treated us badly not just dumb questions, you know what I can type and spell, and took short hand faster and better than the white women I worked with.

The second story included one of her neighbors in East Orange, who refused to acknowledge the fact that she was not Chinese, which in itself was not out of the ordinary, but it was my grandmother's response to the ignorance that I found interesting ,

This nasty lady used to call me Chinese, you believe it! I would explain to her we not Chinese and you know what she said, 'I am still going to call you Chinese' can you believe it. That's ignorance!" At work one person even asked me if I slept on the floors and I replied 'no in a rice paddy in China', and she fell for it! O the nerve

I should have hit them, instead though I would just play a long mess with them a little, you have to find amusement somehow don't you?

As anthropologist, Jon D. Holtzman, in his work with the Sudanese tribe the Nuer and his book Nuer Journey's, Nuer Lives, explains, the relationship between immigrants and already established residents is difficult. The residents naturally struggle with a new group of people settling around them and "often draw on pre-existing stereotypes, images of Africa, and conceptualizations of "the refugee". Although I understand the natural fear of the unknown, I believe in this particular case, the stories of racism were not simply based in stereotypes but rooted in ignorance and the media stereotype of the Asian people.

Racism was a grave reality for my grandmother, and not only specific to the work place. People saw "chinky eyes" and just assumed "dirty dumb immigrants", whether it was provoked or not. In the Macanese case they all seemed to be well-educated people, whose lives were simply controlled by politics and war. I can honestly say, and I hope those who read her accounts will agree, my grandmother is an outstanding woman who made the best of what life handed her. Her life and home lies with her family, a characteristic that I believe was instilled in her by her heritage and culture. The Macanese culture described in this paper is the reason that I am here today. And without their sense of survival their displacement and resettlement I would have been a drastically different human being than I am today.

Although their life in America at first was difficult, they survived and they repaid every debt they owed, "what I am most proud of was we survived with little help, we did it on our own, no welfare system!" Even though they had second hand everything, from furniture to clothes and the fact that my grandma knows how to cook chicken every way possible, (merely fancying up the cheapest protein she could find), they were and are a proud people. My grandparents are what I like to call "an exception to the rule." They were extremely lucky to make it out of China and into the United States; they were very lucky that they found church-based organizations to aid and support them through their transition, but outside of luck they had their drive to survive, a drive that was propelled by pride. This pride has been instilled in their six children, my grandma always says: "Despite everything I think they came out pretty damn good!"

At the end of our interviews, I asked my grandmother, "What nationality would you consider yourself?" Her answer at first was surprising, she said, "I don't know what you mean". With this answer, many things were running through my mind. How could she not know what I meant - this was what all my research is based on? Despite my own urge to press the issue though, I refrained. After more research and after replaying everything in my mind, I decided that her puzzlement was actually the perfect answer.

In Shanghai, she was Portuguese by heritage but Shanghainese in culture, in Hong Kong, she was persecuted for being Portuguese living in Shanghai, a British-ruled city, and in America she is racially categorized as Chinese. As anthropologist, Lisa Malkki, in her essay "Citizens of Humanity: Internationalism and The Imagined Community of Nations" explains, that "connecting internationalism with discourses of 'cultural diversity' and 'multiculturalism' allows us to see

how comfortably the nation form stands in for old established ethnological notions of culture and vice versa".[7]

What Malkki is describing here is the idea that, although we as a world community should interact on an international stage, every human being still needs to belong to a single nation. I truly believe that by understanding herself through the eyes of a Portuguese woman, a Chinese woman, and finally an American woman, my Grandmother is a contradiction as well as a product of Malkki's argument. She is an international woman whose nationality is perpetuated by her understanding of other nationalities and ways of life, and she has always operated under one nationality at a time. Yet, what then can she be categorized as? With this, rather than understanding internationalism as this higher harmonious 'World Spirit' that is totally separate from individual nations, Malkki explains that "internationalism is a transnational cultural and political form" - a form that operates under the guise of anti-ethnic absolutism, but unfortunately fulfills national absolutism. My grandmother's own identity thus transcends national borders; she is an obvious antithesis of ethnic absolutism, not only biologically, but socially, culturally, and physically, so where does nationalism come into play? In this way I agree with Malkki when she concludes, "internationalism does not contradict or subvert nationalism; on the contrary, it reinforces, legitimates and naturalizes it".[7] In the end, I think my grandmother's final American nationality and identity was defined and internationally perpetuated by her past as a Sino-Portuguese displaced by war. In this way, I believe the term "Macanese Culture" is the closest relatable nationality for my Grandmother, especially due to its East/West fusion. But she will be forever grateful to America, for as my grandmother always says, "it goes to show if you have the ability, whatever nationality you are, one can advance, God Bless America."

So, after all this research, what box do I check? I thought long and hard about this, and I choose to check 'Other'. I am not Caucasian, I am not Portuguese, and I am not Chinese, I am American. My name, Caroline Zelinda Bernal-Silva, is English, Dutch, and Portuguese - all three passed down through the generations, but what are they indicative of? Nationality wise, my name means nothing, but obviously, in sentimental terms, it means everything. So despite the argument that, "America is a melting pot that melts all other cultures into white", I believe that America is a melting pot that melts all cultures uniquely into Americanism. America might have a lot of political flaws in terms of immigration policies and placement, but in the end, it is a unique country where exceptions, like my grandmother, are possible. The American Dream, for many, is just a dream, but the very possibility of actually achieving that dream, and transcending class lines is infinitely more real than many other nations can claim. I have no real physical or cultural ties to any other nation, so despite the fact that I understand and sometimes even practice other cultures, I am without a doubt American and until that is a box I can check, I am an 'Other'.

REFERENCES
1. "? Blog." Chinese American Society. Web. 05 May 2010. <http://ca-soc.org/wpmu284a/ca-timeline/>.
2. "The Communist Revolution in China." The University of North Carolina at Chapel Hill. Web. 05 May 2010. <http://www.unc.edu/courses/2009fall/hist/140/006/Outlines/11.China1.htm>.
3. Fujitani, Takashi, Geoffrey M. White, and Lisa Yoneyama. "Absent Images of Memory by Marita Sturken." Perilous Memories: the Asia-Pacific War(s). Durham, N.C.: Duke UP, 2001. Print.
4. Fujitani, Takashi, Geoffrey M. White, and Lisa Yoneyama. Perilous Memories: the Asia-Pacific War(s). Durham, N.C.: Duke UP, 2001. Print.
5. Holtzman, Jon. Nuer Journeys, Nuer Lives: Sudanese Refugees in Minnesota. Boston: Pearson Allyn and Bacon, 2008. Print.
6. "Macau Food - Minchee and Bread Pudim." CLASSICAL ICONOCLAST. Web. 15 Dec. 2010. <http://classical-iconoclast.blogspot.com/2009/07/macau-food-minche-and-bread-pudding.html>.
7. Malkki, Liisa. "Citizens of Humanity:Internationalism and Imagined Community of Nations." Diaspora; a Journal of Transnational Studies (1991). Web. 5 May 2010.
8. McGivering, Jill. Macao Remembers. Oxford: Oxford UP, 1999. Print.
9. Porter, Jonathan. Macau, the Imaginary City: Culture and Society, 1557 to the Present. Boulder, CO: Westview, 2000. Print.
10. Shanghai Exodus. Dir. Greg Andermann. By Fawn Andermann. 2009. DVD.
11. Shipp, Steve. Macau, China: a Political History of the Portuguese Colony's Transition to Chinese Rule = [Aomen Zhongguo]. Jefferson, N.C.: McFarland, 1997. Print.

jur

bernal-silva