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TECHNOLOGY REVIEW

The UR Ventures Technology Review is your monthly look at innovation and technology commercialization at the University of Rochester. In this issue, you will learn about a new system to screen for breast cancer, a newly issued patent detailing compounds and methods for treating MRSA, and good news in the struggle against HIV. Meliora!

Koning Corporation Launches New Product

Koning Corporation, a University of Rochester startup company, launched its Koning Breast Computed Tomography (KBCT) system at the Radiological Society of North America's annual meeting held in Chicago from 30 November through 4 December 2015. The KBCT received Chinese regulatory approval in November, FDA approval earlier in 2015, and has received regulatory clearance in Europe and Canada. Accordingly, this technology has been deemed safe and effective in acquiring high-resolution images to aid in the detection and diagnosis of breast cancer.

Traditional mammography – the present breast cancer screening methodology – requires uncomfortable compression of the breast and only yields 2-D images. By contrast, the KBCT delivers robust, 3-D images of the entire breast without compression. A patient simply lies prone upon the ergonomic exam table, and the KBCT rotates the cone-beam scanner, completing the process in seconds.

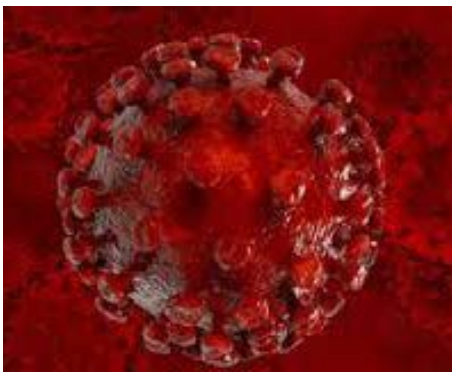
This diagnostic system and method was invented by Ruola Ning, Ph.D., Professor of Imaging Sciences, Oncology, Radiation Oncology, Biomedical Engineering, and Electrical & Computer Engineering at the University of Rochester. The imaging system Koning Corporation now markets is protected by more than 80 U.S. and foreign patents. All of these patents are owned by the University of Rochester and exclusively licensed to the Koning Corporation.

MLK-3 Inhibitor Shows Promise in Fighting HIV

Mixed lineage kinase enzymes, and in particular MLK-3 are known to trigger neuroinflammation, which leads in turn to an array of memory and cognitive disorders. Harris Gelbard, M.D., Ph.D., Professor of Neurology, Pediatrics, and Microbiology & Immunology, and Director of the Center for Neural Development and Disease, along with colleagues Stephen Dewhurst, Ph.D. and Sanjay Maggirwar, Ph.D. from the Department of Microbiology & Immunology, have shown that the compound URMC-099 is particularly effective in inhibiting the production of MLK-3, thereby reducing neuroinflammation and the accompanying deleterious effects. (See UR Ventures Technology Review, Issue 5).

Gelbard and colleagues from the University of Nebraska have also discovered that URMC-099 can boost the antiretroviral activities of nanoformulated antiretroviral compounds (nanoART) that are regularly prescribed to HIV patients. The nanoformulation was developed by a team led by Howard Gendelman, M.D., Professor and Chair of Pharmacology & Experimental Neuroscience at the University of Nebraska Medical Center. In animal models imitating human HIV infection, the combination of URMC-099 with nanoART has successfully eliminated significant numbers of HIV viruses and HIV-infected T cells – reducing virus cell counts to the point where they can no longer be detected.

This unique combination of compounds remains active in the system longer, and – in addition to being more effective than standard treatments – may help to increase patient compliance with treatment regimens. Thus, it holds great promise for cell-based HIV clearance and prevention.



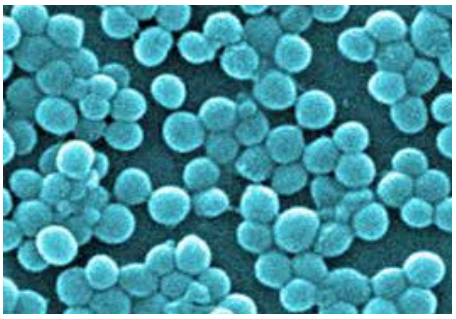
Patent Issues Detailing Compounds and Methods to Treat Staph Infections

Japanese patent #5,837,215, "Anti-Glucosaminidase Passive Immunization for Staphylococcus aureus Infections," issued 13 November 2015. This patent describes monoclonal antibody compositions and methods useful in treating and preventing staph infections, including those caused by methicillin-resistant Staphylococcus aureus (MRSA).

Severe staphylococcal infections are troublesome for several reasons. In addition to developing resistance to traditional antibiotics, these bacteria tend to bond to one another to create a biofilm. This configuration offers more defense against a host's immune system than individual bacterium possess. Thus protected, the biofilm attaches to a surface – bone, muscle, or an implant – and sets to work reproducing and destroying surrounding tissue.

The University of Rochester's patented antibodies, invented by Edward Schwarz, Ph.D., Burton Professor of Orthopaedics and Director of the Center for Musculoskeletal Research; John Daiss, Ph.D., research associate professor of Orthopaedics; and Mark Sullivan, Ph.D. research associate professor of Microbiology & Immunology, targets specific enzymes that the bacteria use to divide, create biofilms, attach to surfaces, and even to protect themselves from the host's immune system. Thus weakened, the bacteria are much more susceptible to clearing by the host's natural defenses.

In December of 2015, patents on these antibodies and methods of their use also issued in Australia and Canada. Additional applications are pending in the United States and Europe. All patents and applications are exclusively licensed to Telephus Medical, LLC, a biotechnology company developing new therapeutics that utilize a patient's immune system to fight stubborn infections. Their first focus is on preventing and treating infections related to orthopaedic implants.



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