Making a Difference!

James Madison University technologies are available for licensing through its affiliate, James Madison Innovations, Inc.

BIOTECHNOLOGY HIGHLIGHTS

BioPlastics

With no dependency on fossil fuels, this alternative method of making biodegradable plastics uses inexpensive feed stocks, like sucrose, to feed the bacteria that grow polymers. The resulting plastics are fully biodegradable within a short period of time. *Dennis et al The technology portfolio consists of five patents: US 6,117,658 Methods of making polyhydroxyalkanoates comprising 4-hydroxybutyrate monomer units; US 5,891,686; US 5,518,907; US 5,371,002; US 5,334,520*

Microfluidic Devices

The patented technology is an improved coating for microfluidic devices for drug discovery, biomedical research and chemical analysis applications. The hybrid polymeric compound forms a UV-transparent coating and can be tuned to solve a variety problems associated with the fabrication and application of microfluidic chips. This patented coating for microfluidic devices, abbreviated PMMA-POSS, combines a silica, silicone intermediate with methylmethacrylate to form an easily manufactured chip with tunable properties for optimum flow. *Landers, Augustine, Hughes, Ferrance, Polefrone (Collaboration between University of Virginia and James Madison University) Patent U.S.#7,381,471*

Novel Therapeutic For Wound Healing And The Treatment Of Ocular Diseases

Lacritin is a human tear protein preferentially secreted by acinar cells in the adult lacrimal gland where it is transported and deposited onto the rapidly renewing epithelia on the surface of the eye. Dry eye is the most common eye disease that affects the quality of life of over 25 million Americans and is a major feature of ocular diseases such as Sjogren's syndrome and blepharitis. The cell proliferation property of Lacritin may offer new treatments to promote wound healing variants offer a new line of defense for the prevention and treatment of bacterial keratitis that addresses the problem of human pathogens resistant to established antibiotic drugs. In collaboration with the University of Virginia, Eastern Virginia Medical School, EyeRx Research, Inc., and Walter Reed Army Medical Center, Washington DC, we are developing the first clinical immunoassay for human tear Lacritin and recombinant Lacritin as a novel anti-microbial therapeutic for wound healing and the treatment of ocular diseases. *McKown, Raab, Laurie et al Patent Pending U.S.#60/844,353*

Cationic Amphiphiles

JMU inventors have developed a promising new series of amphiphilic organic molecules. These novel compounds have a two-headed structure that confers unique properties to the compounds. One application of the amphiphiles is used as antimicrobials. Initial tests have indicated that the amphiphiles could represent a more effective, but less caustic, antimicrobial than many chemical products on the market today.

A wide variety of applications in industrial and consumer markets are being explored due to the unique structures of the compounds. The researchers have filed an initial patent application and are currently working under a two-year research grant that will allow them to develop more analogs, and characterize their biological and physical characteristics. *Caran, Minbiole, Seifert Patent Pending.*

BE *the* CHANGE

Skin Probiotics

James Madison University inventors have filed a patent application on a helpful bacterium that could potentially be used as a therapy for human skin fungus such as athlete's foot. The JMU inventors have developed a potential process to deliver a helpful microbe, *Janthinobacterium Lividum* to the skin using a pharmaceutically acceptable carrier. The microbe has been shown to suppress bacterial and fungal growth on animals and in lab demonstrations.

Infections can be a problem for a wide array of hosts. For example, there are a variety of infections, such as bacterial, viral and/or fungal infections, that affect a large percentage of the human population. *Tricophyton rubrum*, the fungus that causes athlete's foot, is responsible for approximately 46% to 72% of cutaneous and nail mycoses worldwide.

Onychomycosis, a common and persistent fungal infection, is diagnosed in two to eight percent of the global population. The disease can cause disfigurement of nails and/or pain.

Treatments for dermatophytoses currently include antifungal topical products (e.g., terbinafine, itraconazole, miconazole, etc.) and/or systemic therapy. However, some of these treatments can take many months to address an infection and require a relatively large number of applications. Furthermore, the growing problem of antibiotic resistance and the toxicity of relatively long term treatments have formed a need for an alternative treatment in human populations. Probiotics have been utilized for their role in the protection of the digestive tract. More recently, probiotics have been explored for their dermatological applications, although none have included *Janthinobacterium*.

The JMU technology could potentially be developed into a novel over-the-counter probiotic treatment for bacterial and fungal infections on human skin.

Harris, Minbiole U.S. patent pending 12/829,520

Making a Difference…
Working together to build the bioscience community in the Shenandoah Valley

PARTNERSHIP HIGHLIGHTS

SRI International

SRI International's collaboration with JMU, establishing their east-coast presence in the Shenandoah Valley, allows us to expand James Madison University's research agenda. SRI's new Center for Advanced Drug Research (CADRE) was established at SRI Shenandoah Valley in 2006 with support from the Commonwealth of Virginia and partnerships with James Madison University (JMU), Rockingham County, the City of Harrisonburg, the Virginia Economic Development Partnership, and the Shenandoah Valley Partnership. The work at CADRE focuses on improving the productivity of the pharmaceutical industry, helping our nation respond to biothreats, and developing life-saving treatments for neglected and orphan diseases. CADRE builds on SRI's existing pharmaceutical capabilities in Menlo Park, California.

CADRE focuses on proteomics—the study of the proteins that make up living organisms, including infectious agents—to heighten our understanding of the biological systems critical to infection, recovery from infection, and defense against infection. This new understanding, facilitated by both in vitro laboratory experiments and in silico computational biology, can then be applied to detecting and treating diseases such as influenza as well as discovering effective countermeasures against bioterror threats.

BE *the* CHANGE: Collaborate

We invite you to review available technologies and consider partnering opportunities on innovations.

Mary Lou Bourne, Executive Director
bourneml@jmu.edu (540) 568-2865 or FAX (540) 568-8831
1401 Technology Drive, Room 1122; MSC 4904
James Madison University, Harrisonburg, VA 22807
www.jmu.edu/innovation

JAMES MADISON INNOVATIONS, INC.