

Lecture features discussion of new biomaterials role in repairing or replacing limbs and treating disease

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Not many years ago, when someone lost a leg or an eye because of an accident or disease, the usual replacements were wood, glass or metal. "It was better than nothing, but they didn't do much to improve the user's quality of life," said Allison Campbell of Pacific Northwest National Laboratory. "Today, however, thanks to numerous scientific advances, artificial limbs, implants and transplants are making a big difference in the lives of the users, and the future is even brighter."

Campbell will talk at 7 p.m. Wednesday, Sept. 19, at the Columbia Basin College Theater in Pasco about the evolution of materials used to repair joints, replace missing parts of the body and effectively deliver therapeutic agents for treating cancer and other diseases. Campbell's presentation, "Biomaterials: Past, Present and Future," is free and open to the public and will kick off the third annual Community Science and Technology Seminar Series sponsored by PNNL and CBC.



Campbell

A biomaterial is any natural or manmade material that incorporates all or part of a living structure and performs, augments or replaces natural functions. Materials research has advanced significantly from the crude beginnings of artificial limbs and other body parts. Replacing them are novel materials such as metal alloys, metal composites, ceramics and polymers. Biomaterials also can be designed to deliver lifesaving therapeutic agents to affected or diseased tissues. "Advances in the development of these new 'biomaterials' has improved the quality of life and even saved the lives of millions of people," Campbell said.

According to Campbell, however, there are still potential problems with infection, degradation and rejection associated with currently available materials. "Today's rapidly changing and complex medical industry demands a new generation of materials that can solve these problems." And science is delivering," she added.

Scientists are researching new technologies and materials that, together, have the potential for transforming medicine and health. At PNNL, researchers are focusing on developing permanent or temporary "scaffolds" for tissue and organ reconstruction. For example, researchers are working on a quick-setting biomaterial that forms a paste which, when hardened, forms a scaffold onto which natural bone can grow. PNNL researchers also are developing new materials for use in the delivery of therapeutic and biological agents. "We are developing biomaterials that aid in healing, deliver therapeutics, restore lost function and correct deformities," Campbell said.

PNNL's research into the next generation of biomaterials is being conducted in the state-of-the-art Biomaterials Science and Engineering Laboratory where Campbell has conducted extensive research in biomaterials. Her research projects include the development of coatings that fight infection common in artificial joint implants, bone substitutes and techniques to control formation of crystals and other mineral deposits on joints.

Campbell received her Ph.D. in physical chemistry from the State University of New York at Buffalo. Her undergraduate work was completed at Gettysburg College in Pennsylvania.

The Community Science and Technology Seminar Series is supported by the Columbia River Exhibition of History, Science and Technology and by the local chapter of Sigma Xi, the international honor society of scientific and engineering research. ♦