

William R. Wiley

EMSL In Brief

Environmental Molecular Sciences Laboratory

EMSL Director Wins Prestigious R&D 100 Award

A novel water-based process for depositing bioactive calcium-phosphate coatings containing therapeutic agents on orthopedic implants and medical devices has earned the Environmental Molecular Sciences Laboratory (EMSL) Director a prestigious 2006 R&D 100 Award.

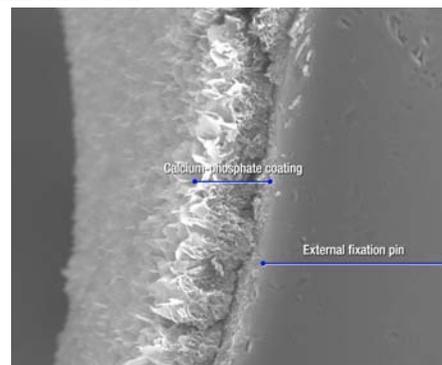
Allison Campbell and her collaborators from the Pacific Northwest National Laboratory (PNNL) developed the surface-induced mineralization process, which provides patients with a two-fold benefit: implants that are bacteria resistant and are easily assimilated into the body. The process involves unique calcium-phosphate coatings containing an antimicrobial agent that was proven in tests to kill infection-causing bacteria or greatly inhibit bacteria growth in the body, helping prevent dangerous and costly post-surgical infections. The water-based deposition process, coupled with the bioactive therapeutic agent, also provides an advanced method for applying pure calcium-phosphate coatings to artificial joints, allowing enhanced bone bonding.

The process differs from existing deposition methods in that it provides uniform coverage of the implant, uses simplified equipment such as vats, and uses room temperatures versus high temperatures to allow simultaneous deposition of calcium phosphate and therapeutic agents into the coating. In 2004, the process was licensed to Bacterin, a biomaterials research, commercialization, and development company that received a \$1.4-million appropriation from the Department of Defense to use the coatings in the battlefield. Earlier this year, Campbell received a Federal Laboratory Consortium Award of Excellence in Technology Transfer for this process under the name "Improving Medical Care and Saving Lives with Bioactive Thin-Film Coatings." PNNL received 5 R&D 100 Awards this year, bringing the number received by the Laboratory since 1969 to 71.

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Allison Campbell



Deposition of calcium-phosphate coatings containing therapeutic agents (above, left) on orthopedic implants and medical devices such as external fixator pins (above, right) can benefit the patient undergoing fracture fixation or joint replacement by helping to prevent costly infection and enhancing bone bonding. Campbell and her PNNL collaborators, Shari Li, Peter Rieke, and Barb Tarasevich, as well as former PNNL staff Lin Song and Marisol Avila, received an R&D 100 Award for developing this process.

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