

PNNL Wins Project BioShield Grants

Researchers to develop ways to counter radioactive materials from "dirty bombs"

The Pacific Northwest National Laboratory received two grants from the National Institute of Allergy and Infectious Diseases (NIAID) for development of products that eliminate radioactive materials from the human body following radiological or nuclear exposure. NIAID is one of the institutes of the National Institutes of Health (NIH).

In the event of an attack by a nuclear explosive device or radiological "dirty bomb," individuals potentially could inhale, ingest or absorb through their skin radioactive atoms called "radionuclides." The PNNL projects will contribute to development of new products that could minimize internal exposure:

- Tatiana G. Levitskaia and her team will receive \$725,000 for rapid development of drugs based on chitosan biomaterials to capture and remove specific radionuclides from the body. Chitosan is derived from the exoskeletons of crabs and other shellfish and currently is sold over-the-counter as a weight loss supplement. The researchers also will establish the toxicity, if any, of chitosan and identify product development pathways. Ultimately, this and other natural materials could be safely and rapidly distributed to the public for both medical mitigation and prophylactic purposes. Levitskaia's team includes key investigators Karla Thrall, Jim Morris, and Rick Traub from PNNL and Tony James from Washington State University.
- Charles Timchalk and his team were granted \$599,747 to create new forms of SAMMS - self-assembled monolayers on mesoporous supports - that could capture and naturally remove radionuclides from the body. Earlier [SAMMS](#) research showed that chelating agents can be attached to mesoporous materials and engineered to latch onto specific radionuclides. Chelating agents can deactivate radionuclides by forming bonds with their ions. The NIAID project will adapt SAMMS technology for radionuclide decorporation in humans. If the team is successful, the next step would be to move the results toward FDA approval. Commercially, this versatile technology is used to removing mercury contaminants from process water and smokestack emissions. Timchalk's team includes co-principal investigator Wassana Yantasee and key investigators Glenn Fryxell and Shane Addleman.



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The PNNL awards were granted under NIAID's Project BioShield authorities. [Project BioShield](#) provides new tools to improve medical countermeasures protecting Americans against a chemical, biological, radiological, or nuclear (CBRN) attack.