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## **Artificial Receptors for *Bacillus anthracis* Specific Anthrose Detection**

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Researchers from the United States of America in cooperation with scientists from Croatia have been working together since November 2011 to develop a solid-phase synthesis of novel cyclic peptide receptor, its optimization using combinatorial chemistry approach, and library screening for optimal anthrose binding. Completion of the proposed studies will pave the way for the design and synthesis of new photophysical sensors for anthrose monosaccharide, and thus new detection systems for rapid and selective *B. anthracis* spores detection. The main research goal is to develop a novel *B. anthracis* sensory system based on the detection of a unique saccharide, anthrose, which is present exclusively on the surface of *B. anthracis* spores. To achieve this goal, novel anthrose specific sensors will be prepared, based on modified peptide antibiotic polymyxin. Advantages of this approach include relatively simple structure of the sensory molecule, ease of synthesis, unlimited access to sensor's synthetic analogs, storage stability and low cost.

Within the two year of the project period the group has successfully synthesized model bicyclic peptide, control glucose lipidic derivative and key precursors necessary for final anthrose derivative system. Glucose and anthrose lipidic derivatives will be used in peptide library screening for selective anthrose binding. Over the coming months the synthesis of anthrose lipidic derivative precursors will take place, and their structural characterization using NMR spectroscopy and mass spectrometry.

Since activities of the Rudjer Boskovic Institute (end-user), besides basic science, include applied research and development as well, at this stage of the project Co-Directors will seek collaboration with the scientists and engineers within the Rudjer Boskovic Institute community. For example, such collaboration is feasible with the development of optical and optoelectronic devices. In the final stages, commercialization plan for the final product will be developed with support of the Rudjer Boskovic Institute, and possible economic partners will be identified.

### **Project Co-Directors:**

- Dr. Predrag Cudic, Torrey Pines Institute for Molecular Studies (NPD)
- Dr. Andreja Jakas, Rudjer Boskovic Institute, Zagreb, Croatia (PPD)

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**Effective Start Date:** 01/11/2008

**Duration:** 3 years; expected completion by October 2011