UC SANTA BARBARA

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NASA Funds UCSB Materials Research

The University of California, Santa Barbara is one member of a consortium of research institutions chosen by NASA to develop new generations of materials that could revolutionize civil aviation and space travel. A grant of $3 million a year for up to 10 years will establish the Institute for Biologically Inspired Materials to investigate and design materials that simulate repair mechanisms used by biological organisms to heal wounds.

The institute's mission is to increase fundamental understanding of natural phenomena and translate its findings into new materials that mimic the extraordinary structural and self-repairing properties of biological substances such as bone or sea shells. These biologically inspired materials could adapt to changing conditions and are expected to help make airplanes and spacecraft lighter, stronger and more reliable.

Much of the consortium's work will focus on creating innovative composites of organic and inorganic compounds. "Many of the strongest materials in nature derive their unique properties from such combinations," said Daniel E. Morse, professor of biology and leader of the Santa Barbara team. In bone, for example, fibers of organic collagen provide great strength under tension, while inorganic crystals allow bones to withstand compression. "We try to understand how biology makes a complex material such as a sea shell, and then, rather than imitating that, we try to extract the fundamental principles we see," said Morse. His group already has discovered interesting mechanical properties in sea sponges that make fiberglass needles and use them to construct intricate structures.

In addition to UCSB, other partner members of the institute are Princeton University, the University of North Carolina at Chapel Hill, Northwestern University, and ICASE, a research institute operated at the NASA Langley Research Center in Virginia. Besides conducting basic research and technology development, the institute will initiate an education and training program in collaboration with the North Carolina Agricultural and Technical State University.

The participants met at Princeton University on September 25 for an initial workshop and planning session.

Note: Daniel Morse can be reached at: d_morse@lifesci.ucsb.edu

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About UC Santa Barbara

The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.