Bioinspired Materials

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Research Summary. The creative and powerful process of evolution has led to the development of diverse organisms and diverse biological approaches to building structures, from chemical compounds to complex organs. With multidisciplinary strengths in biosciences and material sciences, Rice is well poised to make unique and impactful contributions to the design and development of novel materials with diverse functionalities based on insights from biological processes and organisms. Rice has strong research expertise in RNA and DNA structural properties and application in materials and in uncovering and engineering the diverse biochemical arsenal of plants and microbes, the fundamental components for diverse materials. Furthermore, the resilience of multicellular organisms, such as plants, to survive in diverse and stressful environments reveals a capability for remarkable morphological and mechanical property flexibility, powerful properties that can inform future biomimetic design for multifunctional and environmentally responsive materials with diverse applications.

Investments. (i) Collaborative work could be supported through shared student/postdoc salaries and/or research facilities among the research groups with the goal of increasing competitiveness for large center grant support. (ii) Faculty hiring in areas that are synergistic with existing faculty and extend our specialized expertise further.

Impact. Building upon the existing strengths in materials, biosciences, and bioengineering and fostering collaboration among these groups will bring additional recognition and reputation to Rice in this unusual multidisciplinary research area and enhance success of garnering program project, research center, and student training grant support.