

# ENGINEERING ORGANISMS AS BUILDING BLOCK MATERIALS FOR ENERGY AND ELECTRONICS

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**Abstract:** Organisms have been making exquisite inorganic materials for over 500 million years. Although these materials have many desired physical properties such as strength, regularity, and environmental benign processing, the types of materials that organisms have evolved to work with are limited. However, there are many properties of living systems that could be potentially harnessed by researchers to make advanced technologies that are smarter, more adaptable, and that are synthesized to be compatible with the environment. One approach to designing future technologies which have some of the properties that living organisms use so well, is to evolve organisms to work with a more diverse set of building blocks. These materials could be designed to address many scientific and technological problems in electronics, military, medicine, and energy applications. Examples include a virus enabled lithium ion rechargeable battery we recently built that has many improved properties over conventional batteries, as well as materials for solar and display technologies. This talk will address conditions under which organisms first evolved to make materials and scientific approaches to move beyond naturally evolved materials to genetically imprint advanced technologies.