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Synthetic Biosystems for the Production of High-Value Plant Metabolites

Integrated GE^{3}LS Research The Socio-Economic Impacts of Synthetic Biology

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Summary

Synthetic biologists engineer new biological systems that do not exist in nature, using biological parts that are synthesized and combined in different arrangements. This approach gives rise to many questions related to economics, the environment, ethics, government regulations, intellectual property, commercialization and public acceptance. Our team will investigate some of these questions, concentrating particularly on four areas.

First, we will examine the economic feasibility of synthetic biology as an industrial business model and innovation platform. We will explore the proposition that the synthetic biology approach ought to reduce production costs for many different useful plant-based products.

Second, we will analyze concerns arising from intellectual property and patents. There are two: the possibility that pre-existing patents could limit research or cause problems for future commercialization; and appropriate intellectual property policies for new products and processes resulting from synthetic biology research.

Third, we will investigate current government policies and regulations regarding novel plants and their applicability to the products of synthetic biology: whether the products of synthetic biology should be regulated the same or differently from the products of genetic engineering; whether there should be new regulations or mandatory labeling of synthetic-biological products; questions of safety and possible harm to the ecosystem of uncontrolled release of synthetic organisms.

Fourth, we will assess public views of synthetic biology. What does synthetic biology entail and how does it differ from genetic engineering of conventional production processes for plant products? Since the science of synthetic-biology is evolving rapidly, we will develop a continuous process for discussions among the interested public and scientists.