

Synthetic biology in collaboration with nature

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The interlinked global challenges related to depletion of fossil fuels, climate change, food insecurity, environmental degradation, growth stagnation and financial vulnerability are well known and the impacts documented. The successful transition to and realization of a knowledge based bio-economy to counteract these negative developments relies heavily upon the ability to turn these challenges into vehicles for sustainable growth. This demands focus on interdisciplinary research and development and marketability of new and innovative products produced using renewable resources and novel green technologies that possess the transformative power and are within the economic realm. Synthetic biology is gaining recognition as such a transformative technology with the power to provide science based recommendations on how to address a wide range of the global challenges. At our Center for Synthetic Biology "bioSYnergy" (<http://synbio.ku.dk/biosynergy/>), we define synthetic biology as the engineering of biology to produce biological components, systems, cells and organisms that address society's needs. In our approach to synthetic biology, the principles of nature are used to construct systems that fulfill the needs of society. Evolution is past dependent, and we use the opportunity offered by synthetic biology to combine the modules of nature in new combinations with aims directed towards future applications. The creation of artificial life is not within this scope. The societal and ethical implications of our endeavors within synthetic biology are continuously addressed by interactions with ethicists, lawyers and the general public to obtain advice and make sure the approaches chosen and project outcomes are well received. Currently there is "No business like plant business".