

Synthetic Biology in a Nutshell

The emerging field of synthetic biology seeks not only to understand biological systems, but also to go beyond knowledge in order to design biological components. These synthesized compounds or even organisms have the potential to address a host of problems that face our society.

“The idea of synthetic biology is to do for biology what electrical engineers have done for circuit design and chemists have done for the synthesis of chemicals,” says Jay Keasling, professor in the Departments of Chemical Engineering and Bioengineering. “We’re turning biology into an engineering field.”

Applications for synthetic biology include the following:

- Cheap, environmentally responsible production of medicine from microbes – combining genes to create chemical factories within microbes, and produce new drugs (or more efficiently produce existing ones) to fight disease
- Conversion of plentiful, renewable resources into energy – genetically engineering microorganisms that produce hydrogen or efficiently convert sunlight energy into other chemical forms.
- Bioremediation: A natural solution to environmental contamination – studying and engineering microorganisms that possess internal mechanisms that help neutralize a number of important environmental contaminants.

