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Computer-Aided Synthetic Biology: Synthesizing Logic Gates in Biochemistry

The field of synthetic biology is a new discipline which seeks to combine aspects of biology and engineering to facilitate the design of novel biological systems. One particularly critical challenge facing synthetic biologist is the tremendous complexity inherent in biological systems. In numerous fields the design of complex systems has been aided by the development of mathematical models and computer based tools. These tools and models allow designers to shield themselves from unnecessary detail though abstraction and modularity. Our group, being primarily interested in the use of biology for computation, is interested in the development of a computer aided design tool that will allow users to synthesize biological systems from a Boolean descriptions. To accomplish this I've researched the workings of a variety of biological building blocks and used the information gathered to construct a set of biological logic gates. These biological logic gates have now been integrated into a tool that takes a Boolean description of a system and synthesizes a mathematical description of the equivalent biological system.

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