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Methods to Modulate Enzyme Activity and Cooperativity

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Invention Description

Many enzyme based applications and processes could be improved if there were a means to increase or decrease the activity of a specific enzyme under a particular set of conditions. In particular, being able to inhibit one enzyme in the presence of others, stabilizing and maintaining its catalytic activity over time, or enhancing its activity under nonnatural conditions (high temperature, low pH, etc.) could greatly increase the utility of enzymes in a variety of applications. Finally, the ability of switch enzymes on and off depending on cooperative interactions between ligands (chemical logic gating), could be very beneficial in the control of complex enzyme systems.

Researchers at Arizona State University's Biodesign Institute have developed proprietary methods to screen for molecules that modulate enzyme activity, stability, either linearly or cooperatively. Based on microarray technologies, the methods feature highly flexible experimental design, rapid high throughput analysis of molecules and the ability to identify multiple binders to a particular ligand.

Potential Applications

These methods have various applications in the consumer products, biotechnology, pharmaceutical and medical diagnostic industry for:

- **Decreasing amounts of enzymes needed**
- **Extending the range of enzymatic conditions**
- **Stabilizing enzymes over time / temperature**
- **Modulating enzyme activity**

Benefits and Advantages

The present invention facilitates:

- **Rapid high throughput enzyme modification**
- **Identification of multiple binders *in situ***
- **Modulation of enzymatic activity under desired conditions**

Intellectual Property Status:

Patent pending

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