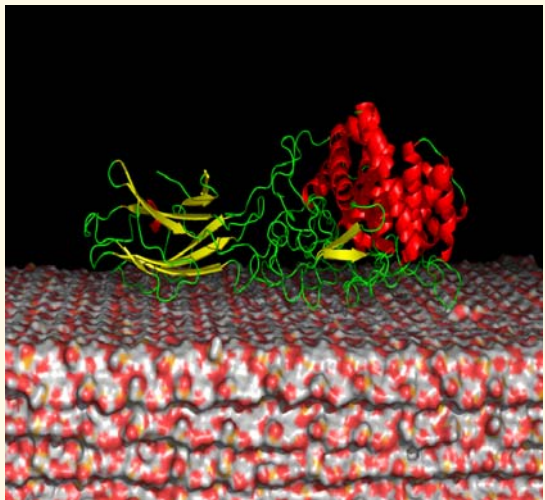


# Optimization of Industrial Enzymes

## A Breakthrough for Greater Enzyme Efficiency

**Model of Cel9A from *Thermobifida fusca* on surface of cellulose**



### Summary

Enzymes are highly efficient naturally occurring catalysts that are used in a wide range of applications from industrial processes to new drug development. Conventional mechanism for understanding the mechanisms of enzyme functions are costly and time consuming. Moreover, many applications do not increase the activity energy to be applied to enzymes with slow reaction rates.

Scientist at ORNL has developed a new technology that provides a much cheaper and more efficient solution by using computer simulations. This technology manipulates naturally occurring enzymes such that the reaction rates increase by more than six orders of magnitude. This technology will not only significantly improve efficiency but also impact the use of the enzyme in a variety of industrial processes such as biofuels.

### Advantages

- Superior technology that enables an increased performance of over six orders of magnitude compared to current enzyme based technologies
- Makes current enzyme based reactions more efficient and less energy intensive
- Potential to enable new enzyme based applications
- Wide implications from drug discovery to ethanol production

### Patents

- (UTB – ID 1716 and UTB – ID 1717) [Identification and modification of dynamical regions in proteins for alteration of enzyme catalytic effect](#)

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