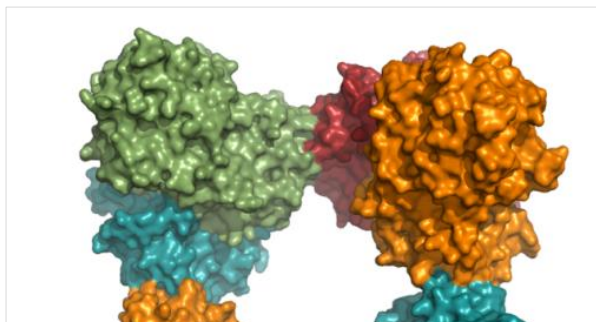


Molecular Engineering of Enzymes



The group is open to discuss any kind of collaboration with industry and academia related to these topics.

The work of the group is focused on the study of structural and functional aspects of biotechnologically relevant enzymes with potential applications in diverse industrial areas such as bioethanol or prebiotic production. The group uses a mixed strategy that combines directed evolution and rational design techniques aimed to improve the properties of selected enzymes. Structure-based models and crystallographic protein structures are used to analyze different aspects of enzyme performance such as substrate specificity, resistance to denaturing agents, inhibition, etc.

FIELD OF EXPERTISE

The group uses protein engineering techniques to modify the structure of enzymes in order to modify their physico-chemical or catalytic properties. As a result, enzymes more resistant to the effect of denaturing agents (temperature, pH, inhibitors) or enzymes with new functions are produced. In some cases, the modifications are made to modify the protein structure in a way that it can be attached to a solid support, allowing enzyme immobilization.

The group has developed several enzymes with novel catalytic properties and a procedure to implement its use at industrial scale. Examples are the modification of yeast invertase for the production of prebiotic fructooligosaccharides (patent application P201431747), the modification of β -galactosidase for the production of galactooligosaccharides, or the generation of new variants of glucose oxidase with increased thermal resistance.

MAIN APPLICATIONS AND SERVICES

- Improvement of the resilience of enzymes to facilitate their use in industrial procedures.
- Modification of enzymes to allow their immobilization by attachment to solid supports.
- Development of enzymes with improved or new properties.
- Predictive modeling of protein structures.
- Genetic engineering techniques (PCR, site-directed and random mutagenesis, cloning).
- Chromatographic techniques for protein purification and sugar analysis.



FURTHER INFORMATION

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