



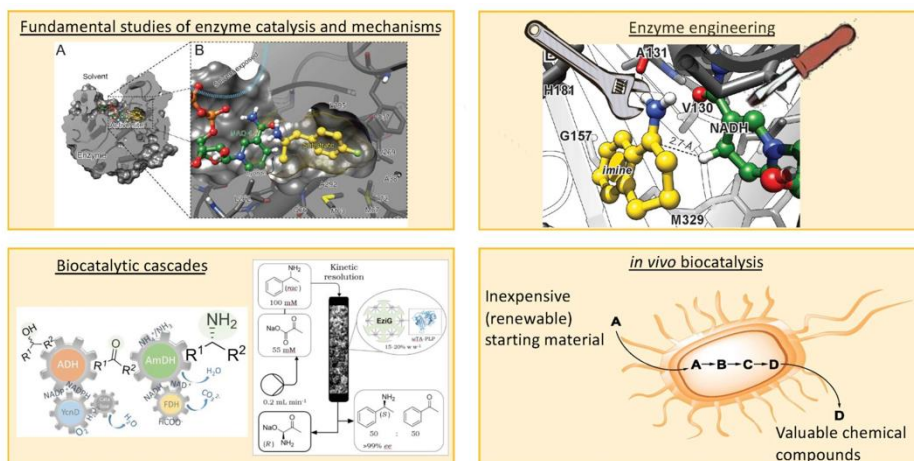
Francesco G. Mutti

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Exploring New Horizons in Biocatalysis: Leveraging Enzyme Engineering for Organic Synthesis, Polymer Characterization, and Bio-electrochemical Applications

My group is actively involved in enzyme catalysis for organic synthesis, encompassing studies on mechanism, enzyme engineering, and the development of biocatalytic cascades both in vitro and in vivo. For example, we have engineered thermostable variants of novel enzymes such as amine dehydrogenases (AmDHs) and utilized them in synthesizing enantiopure amines as API intermediates. We have also developed multi-enzymatic cascades for converting alcohols, styrene derivatives, α -amino acids, or α,β -unsaturated ketones into chiral amines or amino alcohols containing up to two stereogenic centers. The efficient synthesis of chiral amines was also achieved in continuous flow systems by using immobilized AmDHs or ω -transaminases (ω TAs). Additionally, we have discovered new enzymatic activities such as the synthesis of nitriles from alcohols using oxidases, and have developed a wide range of enzymatic reactions including chemoselective oxidation of aldehydes or regioselective sulfation of steroids. Our research also extends to biocatalysis for synthetic polymer degradation (e.g., polyesters and polyamides), and engineering oxidoreductase enzymes for bio-electrochemistry applications in biosensors and bio-electrocatalysis.



Francesco Mutti is professor of bio-organic chemistry and biocatalysis at the University of Amsterdam (Netherlands). He graduated in Industrial Chemistry (2004) at the University of Milan (Italy). After obtaining his PhD in Chemistry (2008), he was research associate in the groups of Prof. Wolfgang Kroutil at the University of Graz (2009-2012) and Prof. Nicholas Turner at the University of Manchester (UK; 2013-2014). Since 2015, he is the group leader of the Biocatalysis at the University of Amsterdam. Among the others, he has been a Marie Skłodowska-Curie fellow and received an ERC Starting Grant as well as several EU, Dutch national grants and industry funds. Among the others, he is Fellow of Royal Society of Chemistry (UK) and honorary member of the Argentinian Chemical Society. His main research interest is on the development of biocatalytic cascades for the sustainable synthesis of chemicals, enzyme discovery and engineering, continuous flow biocatalysis, biocatalysis in vivo and bio-electrochemistry.

Lunedì 20 maggio 2024, Ore 12:00, aula E

Ospite: Prof. Paolo Bergese