

## **A New Insight into Lipase Catalysis at Interfaces**

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Lipases are interfacial activated enzymes which acquire their activity due to adsorption at interfaces in a respective conformation. Interfaces, made of lipid and proteins, are not only of great importance in the functioning of natural membranes but are also involved in a wide variety of biological processes such as intestinal fat digestion and lipoprotein metabolism. However, the physico-chemical dynamics occurring at the interface upon lipase biocatalysis, are not well understood. An understanding on the influence of lipase generated molecules on it's activity leads to new approaches on the modulation of the enzymatic reactions (e.g. fat metabolism).

Our investigation concerns the physical processes acting during lipase reactions at solid/liquid and liquid/liquid interfaces

Applying a new approach, our studies were focused on lipase reactions in controlled microenvironments formed by self assembly monolayers (SAM's).

Results demonstrate that the wetting of the surface layers by the aqueous glycerol solution is detrimental in controlling lipase reaction mode.

A systematic approach on lipolysis using the Pendant Drop Technique, allowed us to conclude that the interfacial composition is dramatically changed upon enzymatic catalysis.

We anticipate that our findings can contribute for a better understanding on the mechanisms influencing lipase catalysis in different reaction media.