

Supporting Information

Interfacial Processes that Modulate the Kinetics of Lipase-Mediated Catalysis using Porous Silica Host Particles

Paul Joyce^a, Catherine P. Whitby^b & Clive A. Prestidge^{a,}*

^aSchool of Pharmacy and Medical Sciences, University of South Australia, City East
Campus, Adelaide, South Australia 5001, Australia

^bInstitute of Fundamental Sciences, Massey University, Private Bag 11222, Palmerston
North 4442, New Zealand

*Corresponding Author. Telephone: +61 8 8302 3569. Fax: +61 8 8302 3683. Email:
clive.prestidge@unisa.edu.au

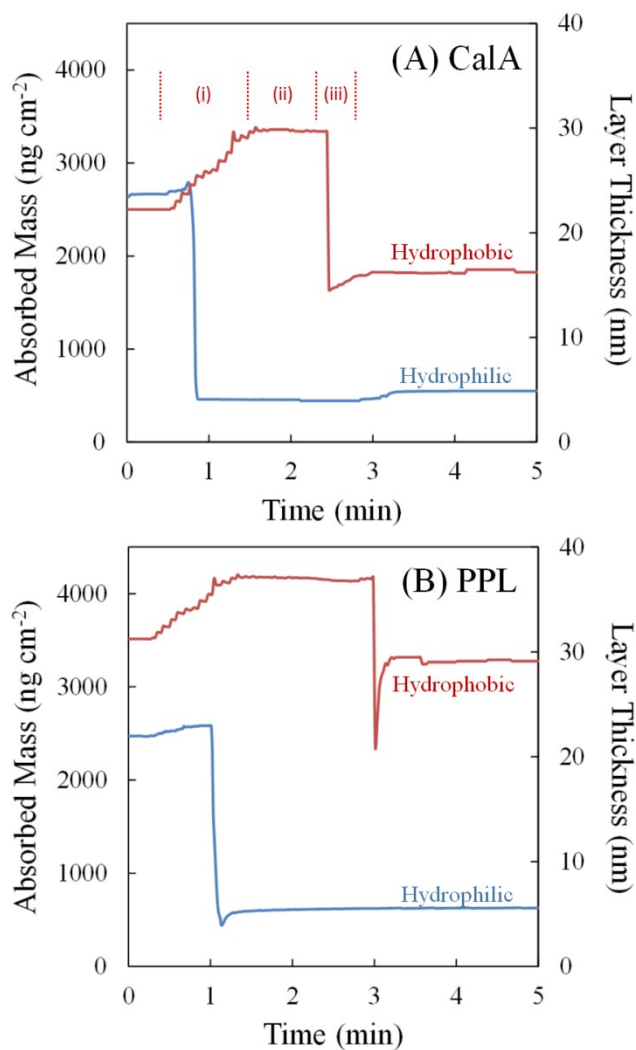


Figure S1: Adsorbed mass (left axis) and layer thickness (right axis) as a function of time during lipase-mediated hydrolysis of a tributyrin film on a hydrophilic (blue line) and hydrophobic surface (red line) for (A) CalA and (B) PPL. Lipase injection occurred at $t = 0$ min and flow rates remained constant at $10 \mu\text{g mL}^{-1}$ for all samples. The following phases are labelled for CalA-mediated hydrolysis on hydrophobic silica: (i) lipase adsorption, (ii) accumulation phase whereby digestion products adsorb at lipid-in-water interface, and (iii) mass ejection of digestion products.

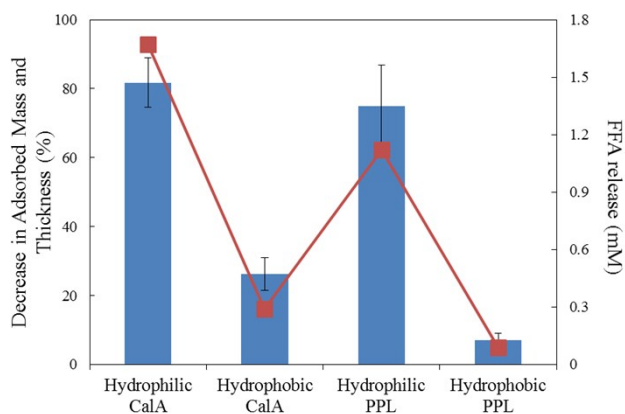


Figure S2: Decrease in adsorbed mass and layer thickness (left axis, blue bars) and FFA concentration in ejection media (right axis, red squares) as a function of silica surface chemistry and lipase extract for the lipase-mediated hydrolysis of a tributyrin film.

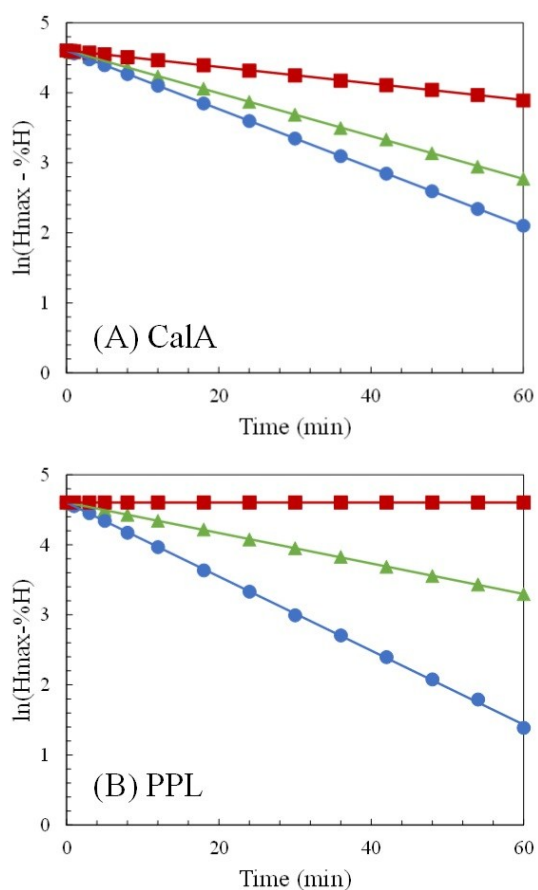


Figure S3: Pseudo-first-order fit for hydrolysis of tributyrin (○) emulsion droplets, (●) loaded in PS-1L and (■) loaded in PS-2L for (A) CalA and (B) PPL.