The biological catalysts, enzymes, are generally far superior over synthetic ones. Hence, it is truly inviting to incorporate the strategies that Nature employs in the design of artificial enzymes. We have developed an efficient ‘inside-out’ protocol for the in silico design of new enzymes (theo-zymes). Specifically, this talk will focus on theo-zymes for Kemp elimination. It will show how new enzymes are being engineered, tested in silico and in vitro, evaluated, and optimized to perform catalysis ahead of Nature, and how far human kind has advanced in this extremely young area of science.