

## CASE STUDY | BIOCATALYSIS IN DRUG DEVELOPMENT & MANUFACTURING

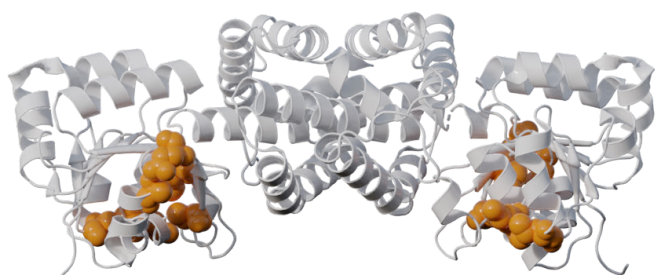
### Regaining **Stability**

An imine reductase from *Myxococcus stipitatus* was engineered for altered cofactor specificity (NADH) and reversed stereoselectivity (*S*-selective) by the introduction of eleven mutations.

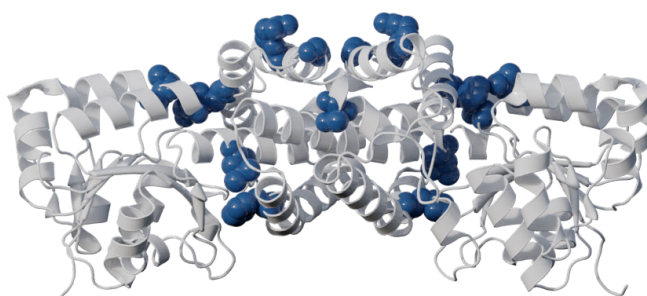
While both specificity and selectivity were positively influenced, these changes unfortunately resulted in poor stability and insufficient expressibility of the variant. After a detailed stability investigation using our

Catalophore™ Stability Workflow, critical structural features affecting stability were identified by looking at *intra*- and *inter*-chain interactions. Eight positions were targeted as additional mutation sites aiming to regain stability.

While the final variant showed stability and activity comparable to the wild type, specificity and stereoselectivity remained unaffected.



**Intra-chain**



**Inter-chain**

Engineered imine reductase variants with stabilizing interactions (e.g., disulfide bonds, salt bridges, hydrophobic interactions,...) consistent with the phylogenetic context.