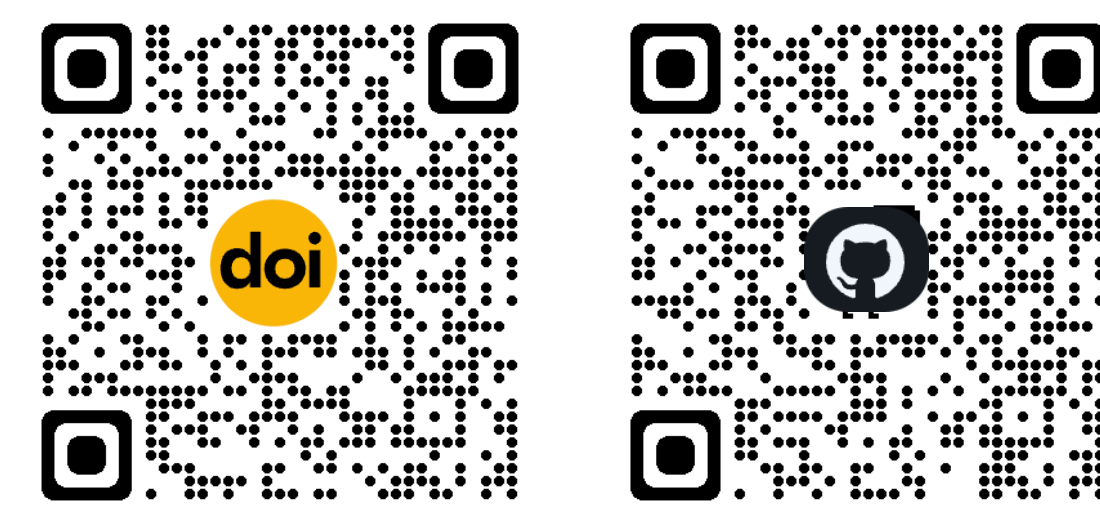


# Accelerating Antimicrobial Peptide Discovery with Latent Structure



UC SANTA BARBARA



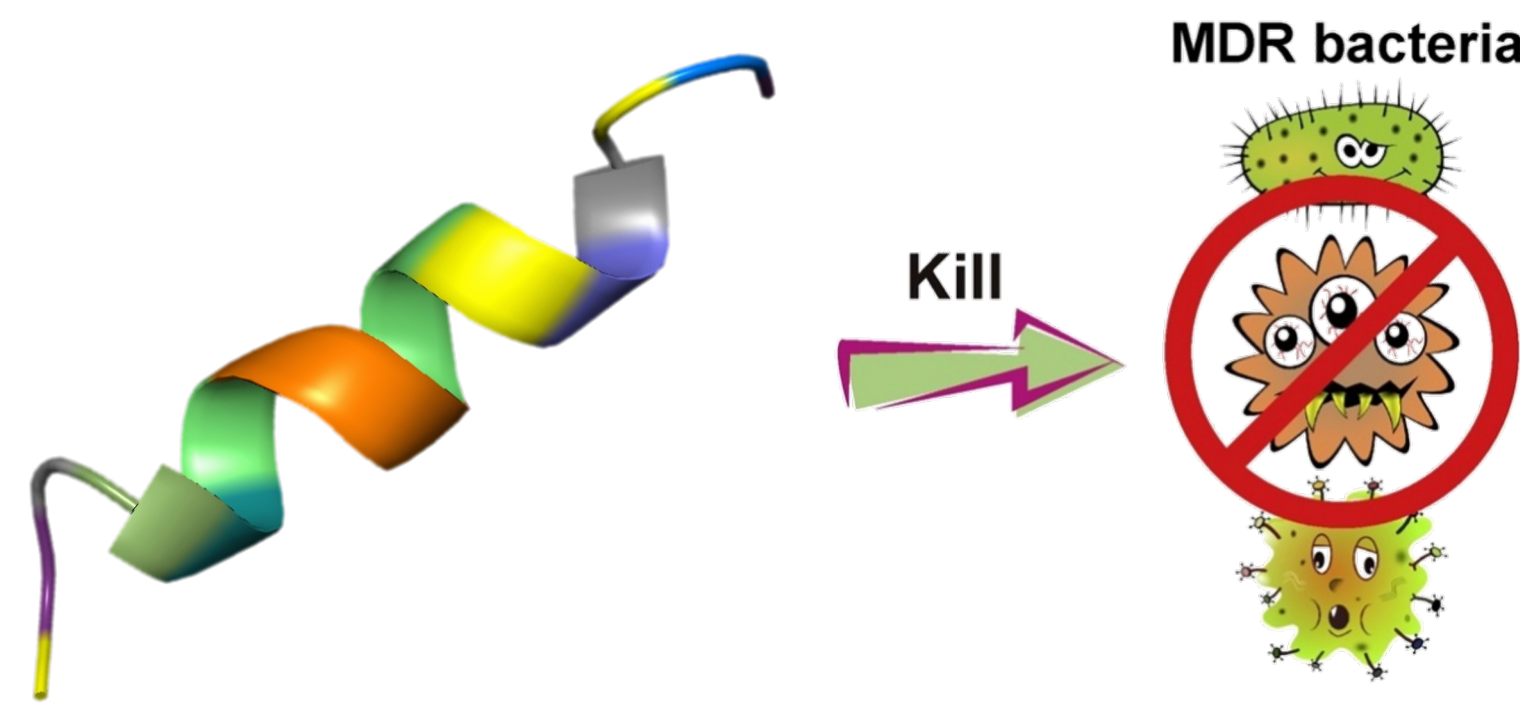
Danqing Wang, Zeyu Wen, Fei Ye, Lei Li, Hao Zhou danqingwang@ucsb.edu



Promising therapy: Antimicrobial Peptide

Latent Sequence-Structure Model (LSSAMP)

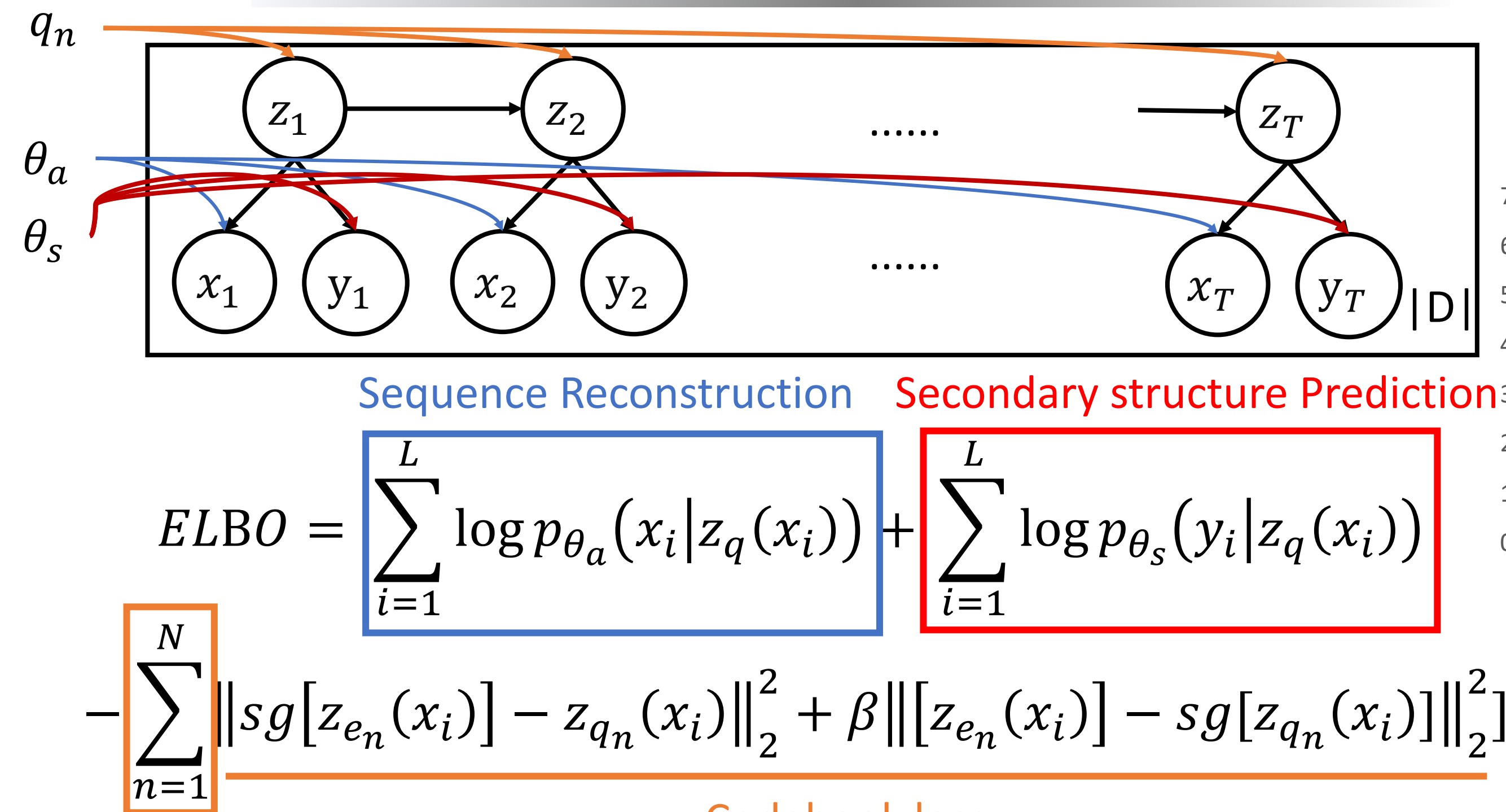
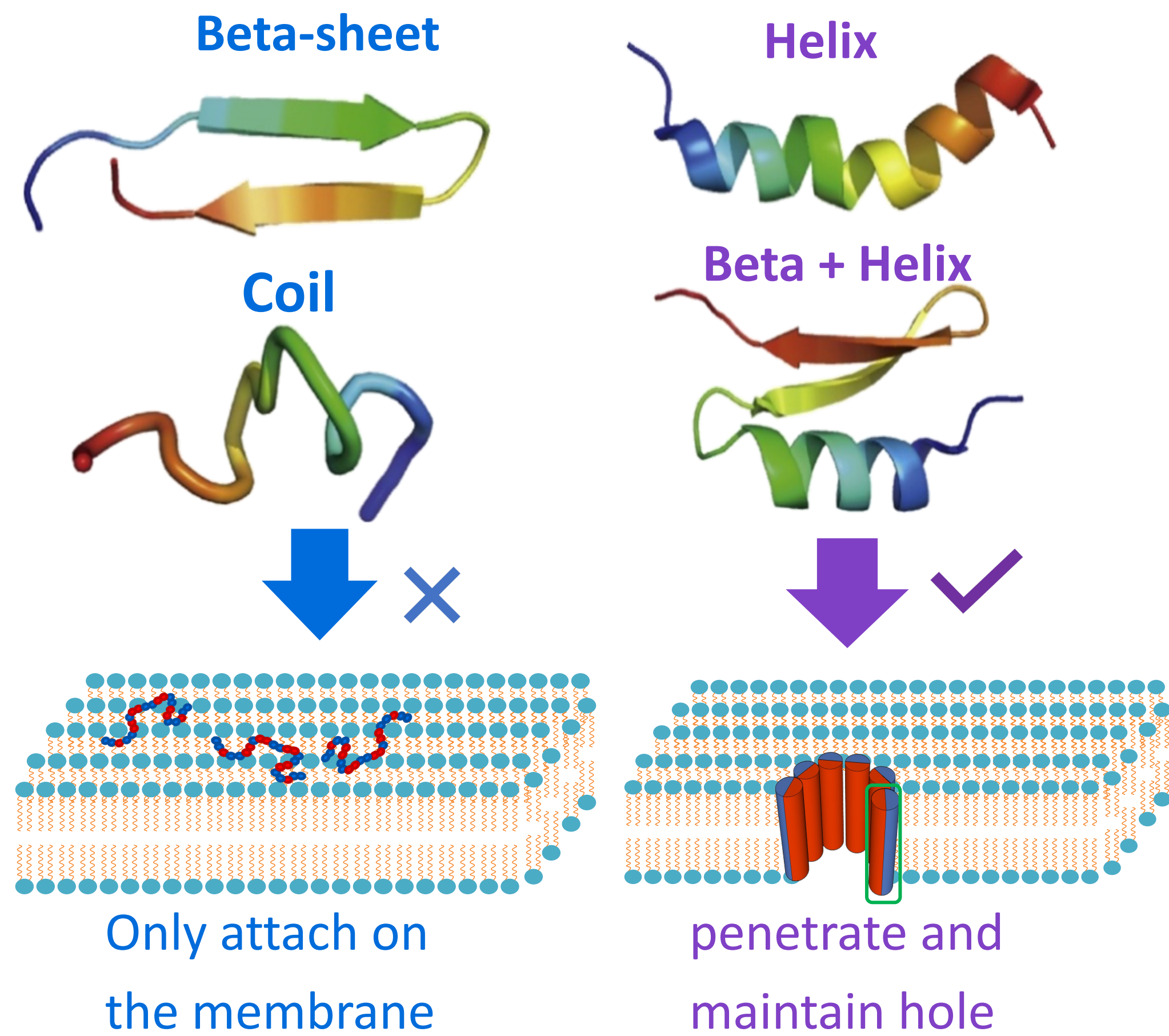
LSSAMP outperforms baselines



**Antimicrobial Peptide (protein)**  
Powerful fighter to kill bacteria

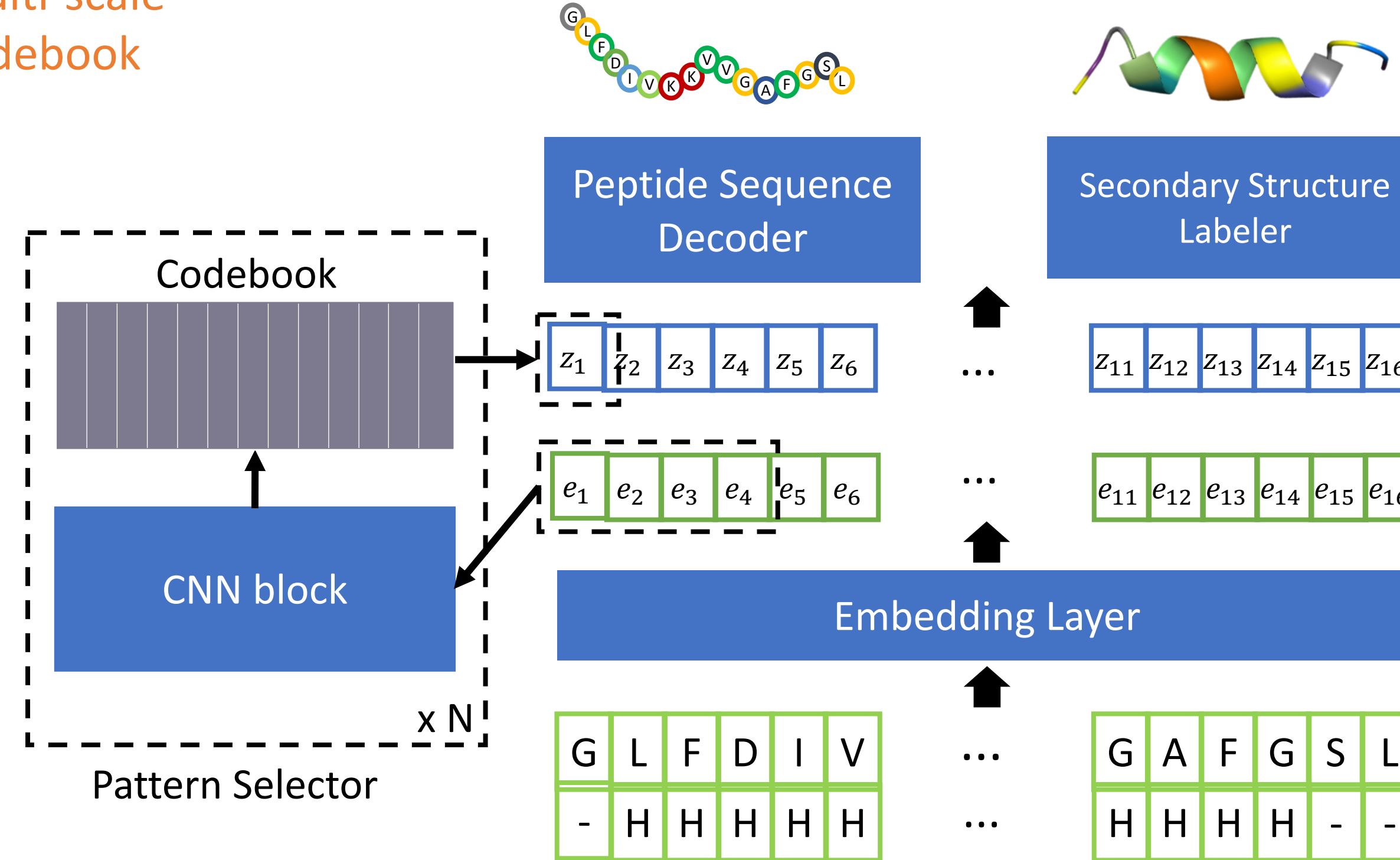
Structures are important for biological functions

Generate ideal peptide sequences with an ideal secondary structure simultaneously!

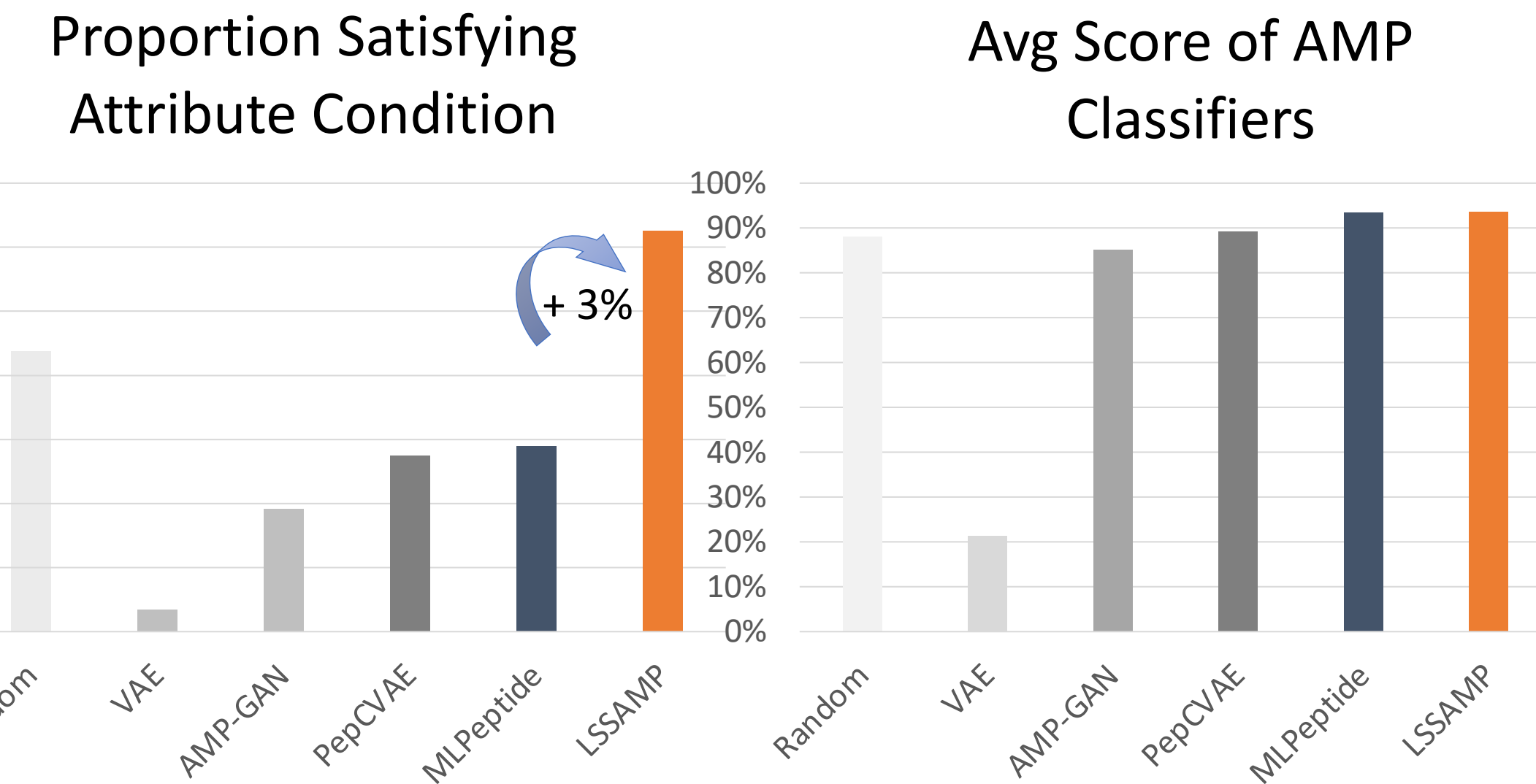
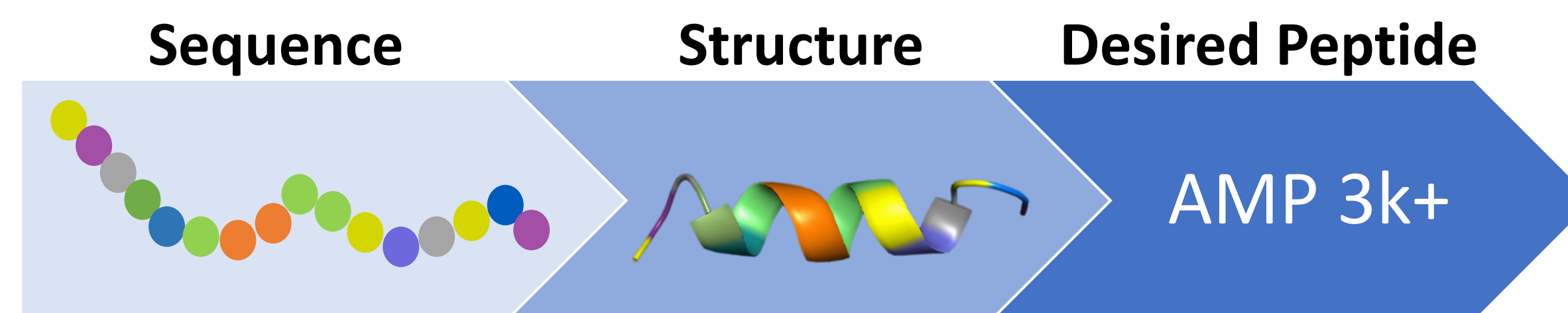


Multi-scale codebook

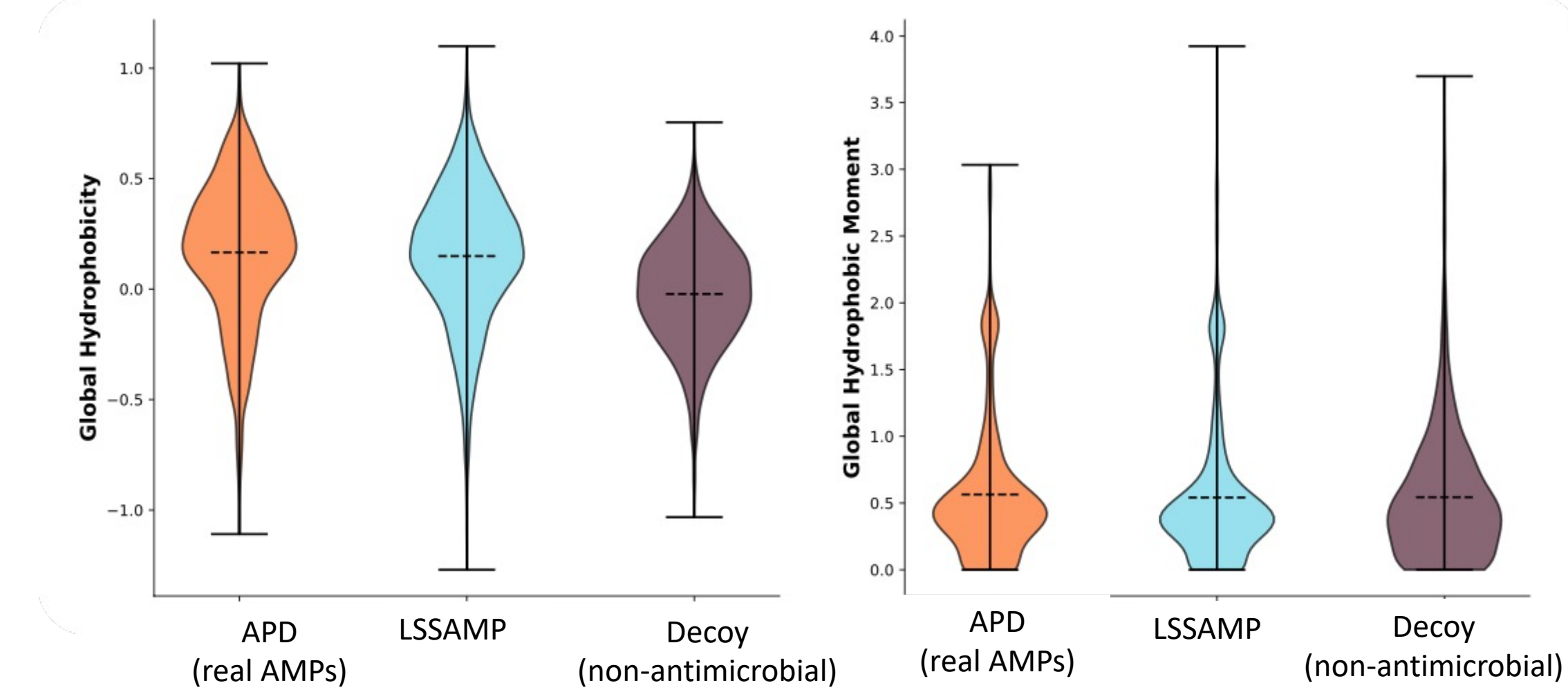
Codebook loss



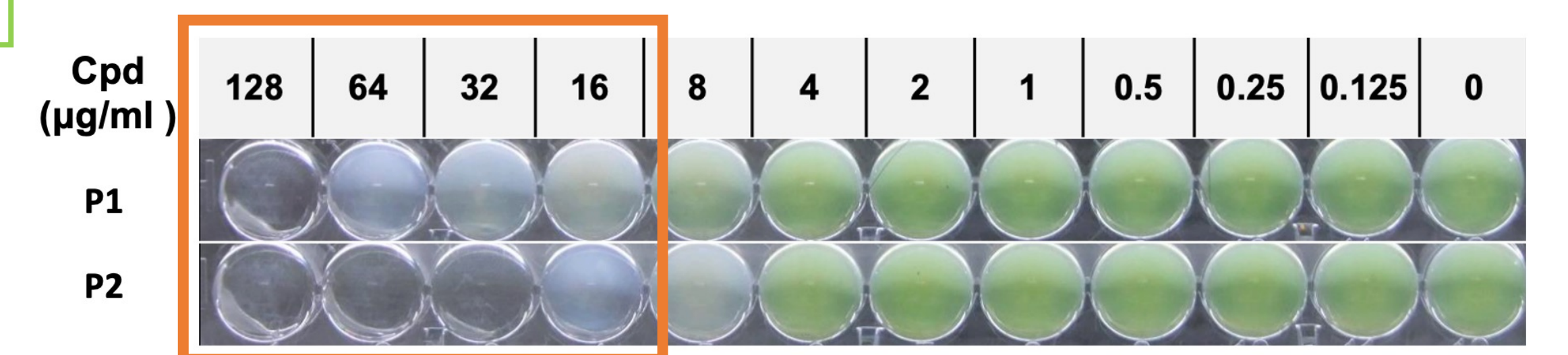
Data Augmentation in LSSAMP



LSSAMP generations share similar distribution as real AMPs



LSSAMP Produces Effective AMPs in Wet Lab



Clear liquid indicates bacteria (green) have been killed!