Outline Syllabus for an MDH cCURE targeted for 2nd Semester Chem/Bio Majors

Virtual vs Hybrid Teaching

Big Picture Focus: Drug Design

Parasite vs Host MDH

      Pick your Pathogen

Key CURE Elements: Relevance, Scientific Background, Hypothesis Development, Proposal, Experiments/Teamwork to test hypothesis, Data Analysis and Conclusions, and Presentation

Concept/Content Focus:

Chemistry:NonCovalent Interactions, Structure-Activity Relationships, pKa

Biology: Central Dogma, Protein Structure-Function Relationships

Introductory Week: Goals of the Course, Key Background Bootcamp

Week	Virtual Focus	Hybrid or Wet lab Focus	CURE Element	Comments
1	Background Paper, Big Picture	Background Paper, Big Picture	Relevance Scientific Background	Faculty choice, Student choice
2	Information from Sequence	Information from Sequence	Scientific Background	Introduce evolution connection etc
3	Structure Visualization	Structure Visualization	Scientific Background	Tie in with Non Covalent interactions & structure etc
4	Hypothesis Development I	Hypothesis Development I	Hypothesis development	Hypothesis to questions
5	Hypothesis Development II	Hypothesis Development II	Proposal	Questions to Experimental Approaches
6	Preparing your Proteins	Site Directed Mutagenesis	Experiments	Host & parasite enzymes, design mutants to test hypothesis
7	Basic Characterization of your Protein-	Protein Expression & Purification, Purity etc	Experiments	Are the models good models?

	comparison with wildtype			Compare with known pdb files etc
8	pKa experiments I	Kinetics, pH Dependence/Titration	Experiments	Start with H++ paper
9	pKa experiments II	Kinetics, pH Dependence/Titration	Experiment/Data Analysis/Conclusions	Statistical analysis and representation of data
10	SwissDock experiments I	Ligand Binding	Experiments	Start with SwissDock paper
11	SwissDock experiments II	SAR (Binding, Kinetics)	Experiment/Data Analysis/Conclusions	Statistical analysis etc
12	HawkDock experiments I	Subunit Interface analysis: SEC	Experiments	Start with HawkDock paper
13	HawkDock experiments II	Subunit Interface Analysis: SEC	Experiment/Data Analysis/Conclusions	Statistical analysis etc & representation

Final Week: Presentations