Modeling: Induced Fit in a Multienzyme Complex

Advanced Preparation:

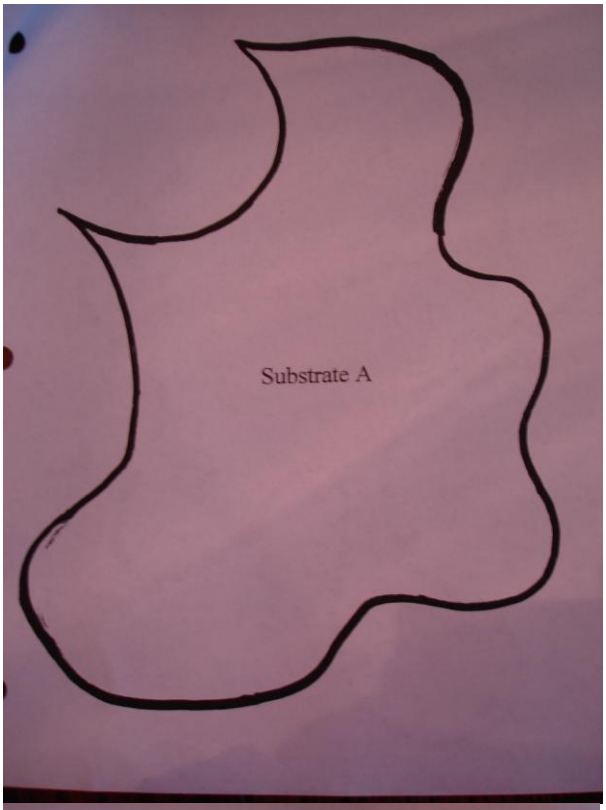
Prepare Model. Enlarge the patterns and cut out in paper or foam sheets. The pair of model pieces which make the active site of each enzyme should be made of the same color. The pieces should fit together nicely.

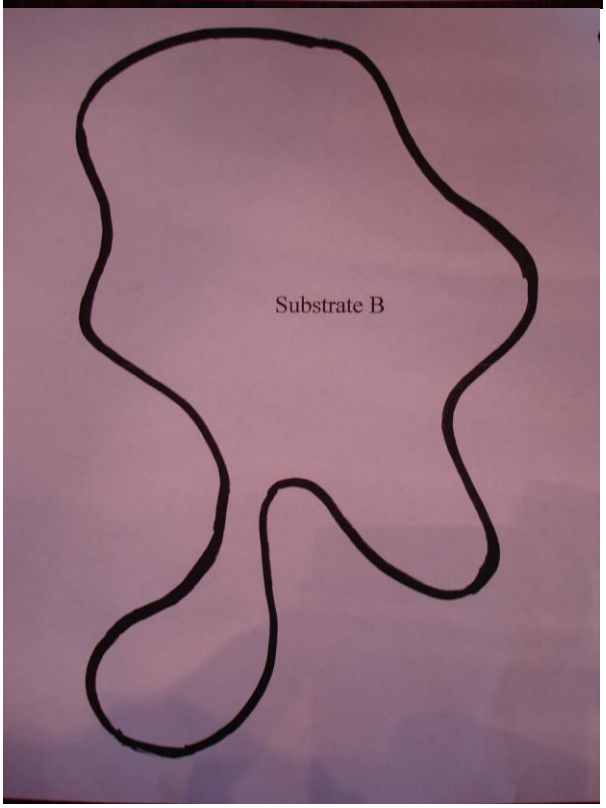
Pieces needed:

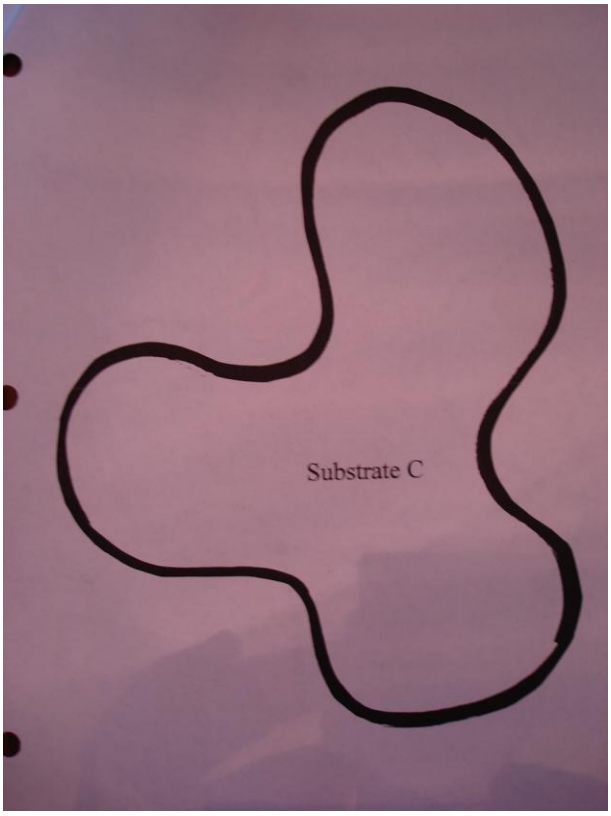
- **2- enzyme 1 active site**
- **2- enzyme 2 active site**
- **2- enzyme 3 active site**
- **4- substrate pieces**

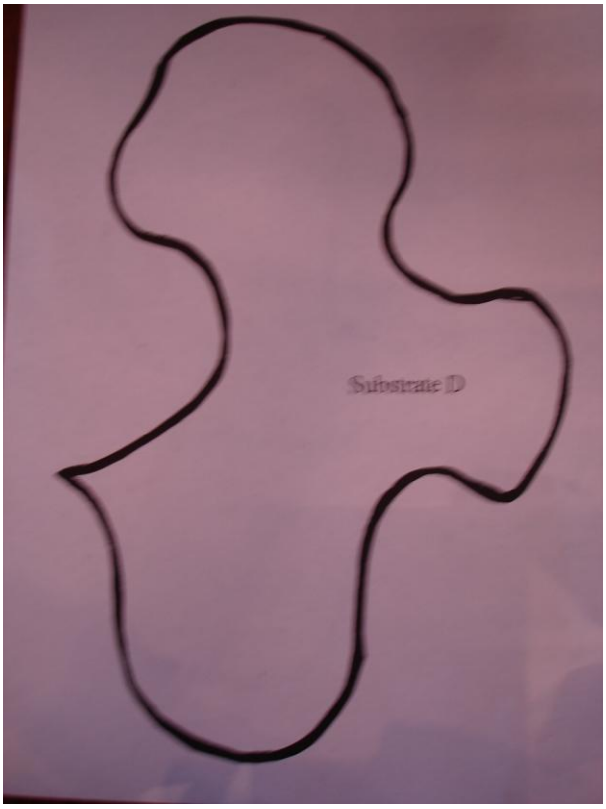
Activity:

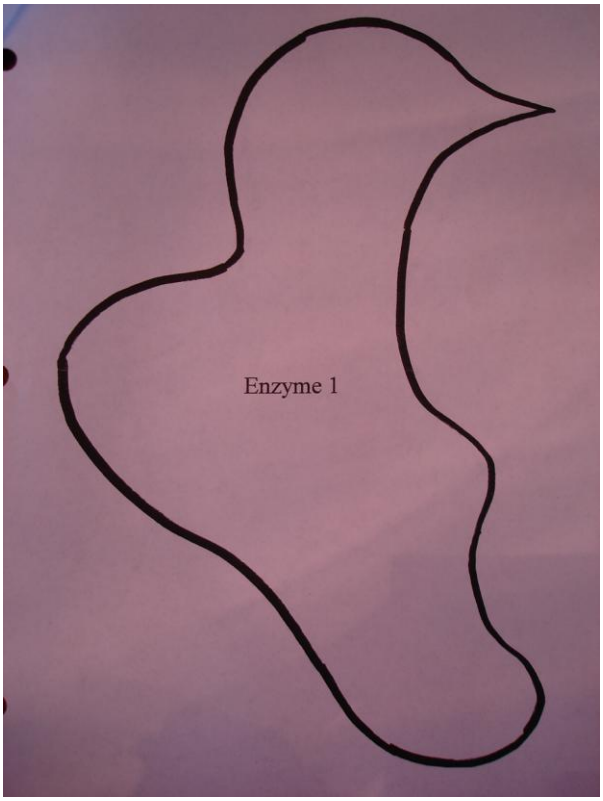
1. **Arrange the 4 substrate pieces on the floor as shown in this handout.**
2. **Divide students into three groups representing three different enzymes.**
3. **Beginning with the enzyme 1 group, arrange the students in a line. Give an enzyme active site piece to the students on either end. Emphasize to students they are representing groups of amino acids making up the enzyme and that the foam active site pieces are a small part of the enzyme.**
4. **Students must stay connected by touching shoulder to shoulder. Relate this to the covalent bonds holding the amino acids together.**
5. **The students on the ends, holding the active site pieces, need to match them with the substrate. All the students (in the enzyme) will need to move in order for the end students to reach the substrate. In this way the students are able to model the change in enzyme shape seen in induced fit. Remove the first piece (Substrate A), and repeat with enzyme 2 and enzyme 3.**

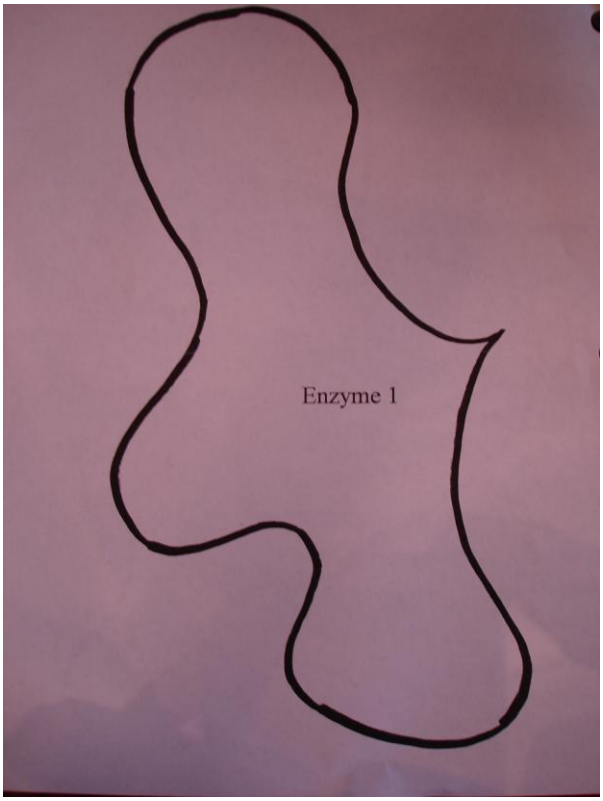

Substrate A

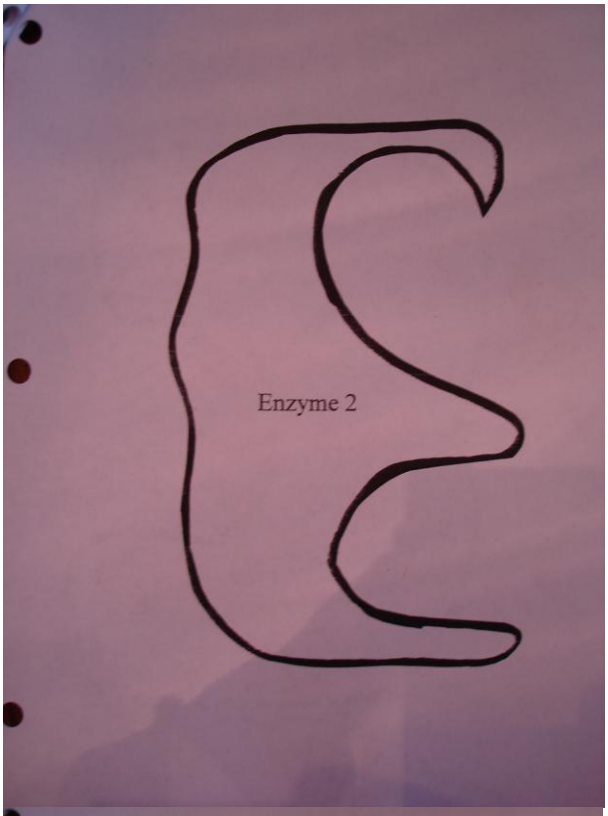

Substrate B

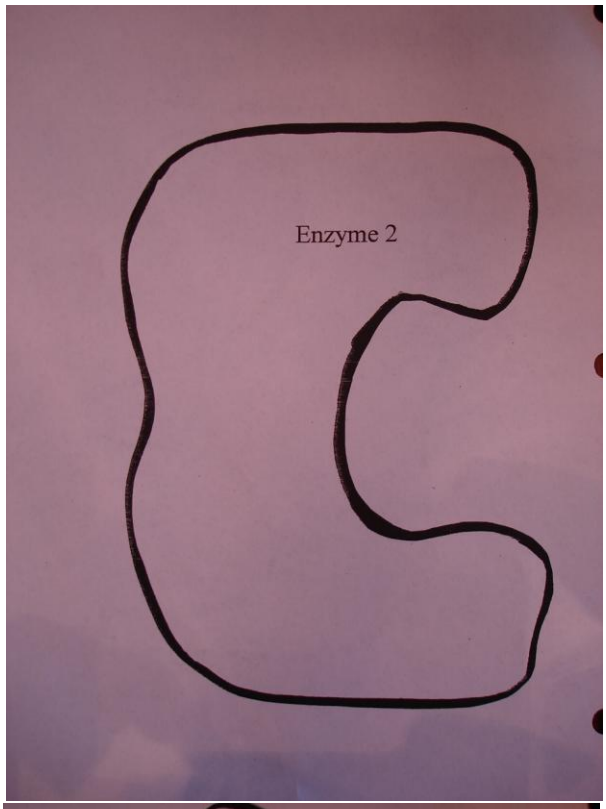

Substrate C

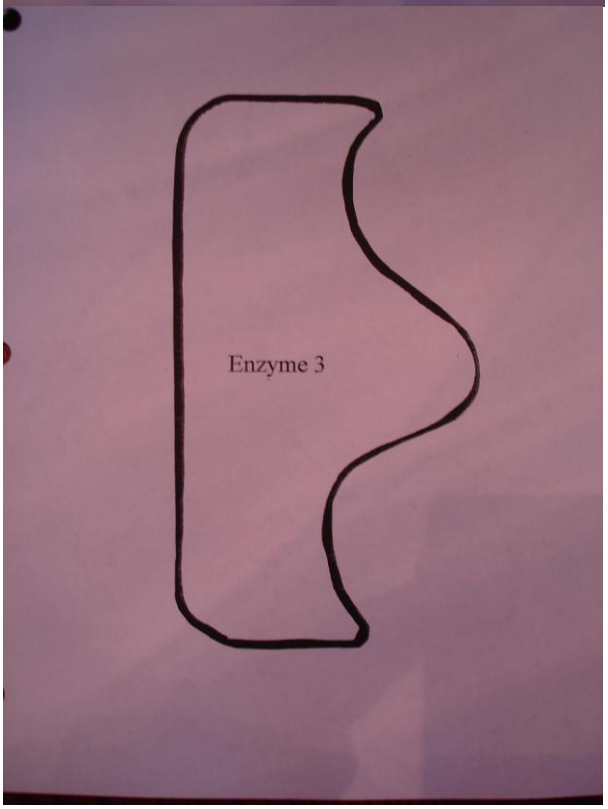

Substrate D

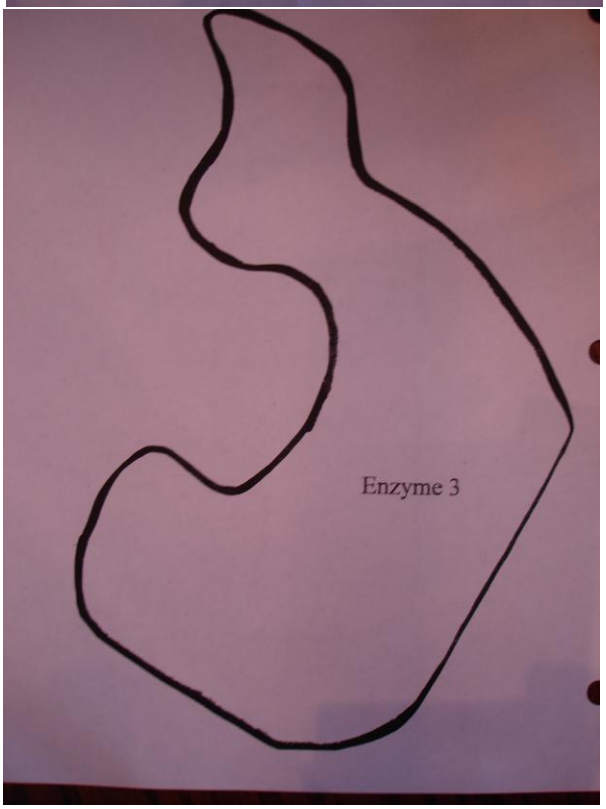

Enzyme 1

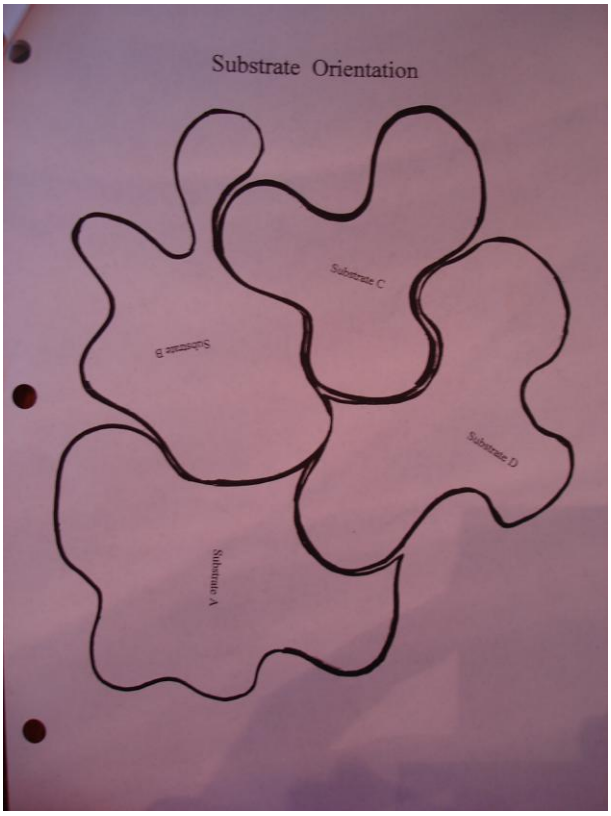

Enzyme 1

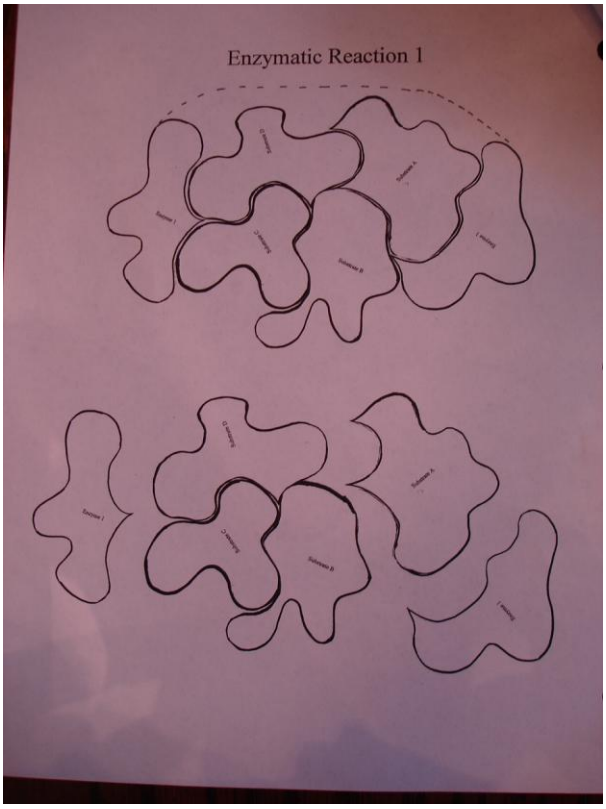

Enzyme 2

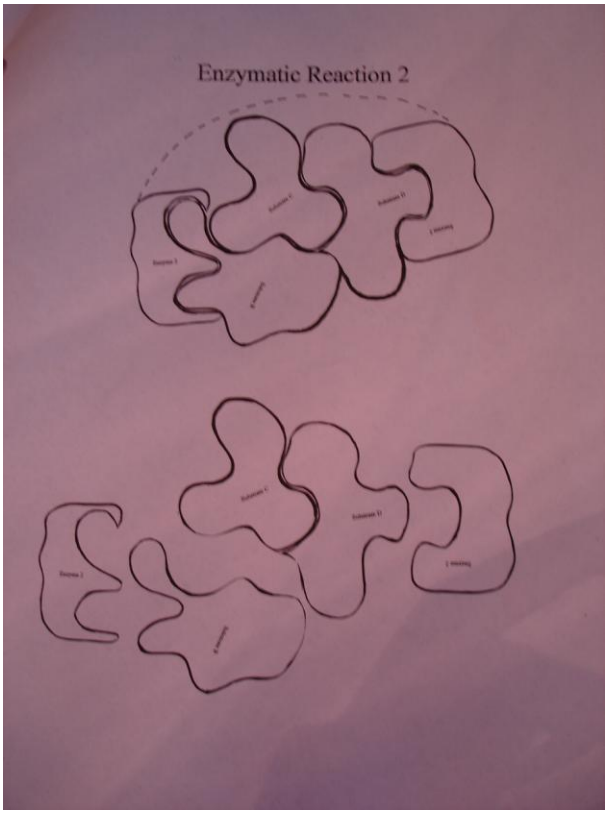

Enzyme 2

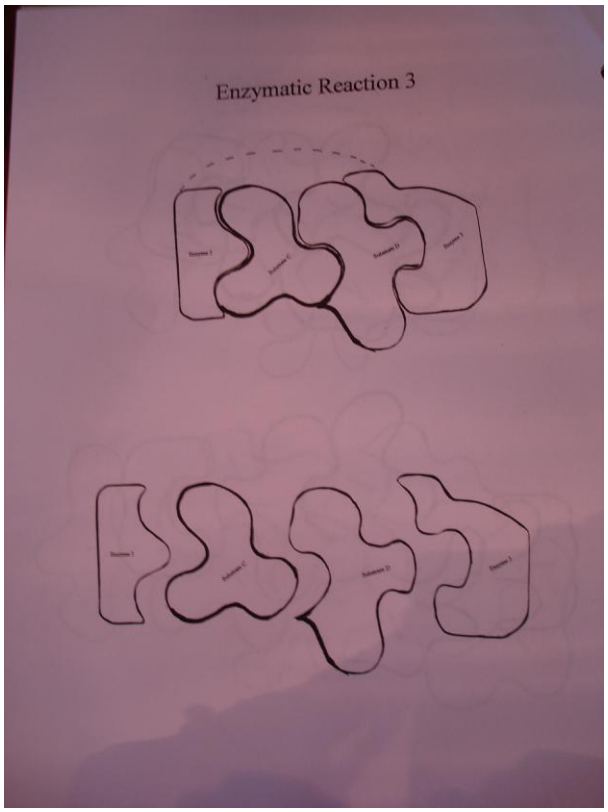

Enzyme 3


Enzyme 3


Substrate Orientation
Substrate C
Substrate B
Substrate D
Substrate A


Enzymatic Reaction 1


Enzymatic Reaction 2


Enzymatic Reaction 3