3d molecular designs

Transforming Science Learning

Folding and Molding Hands-on Protein Structure

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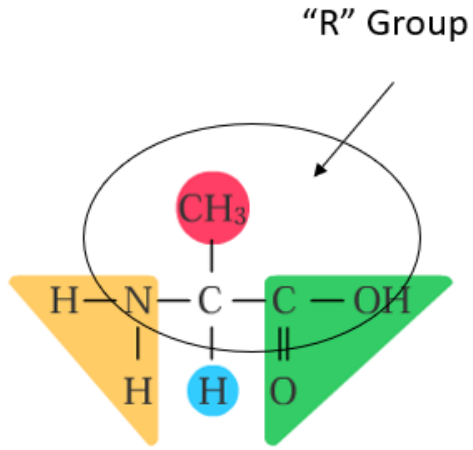
Workshop Learning Goals

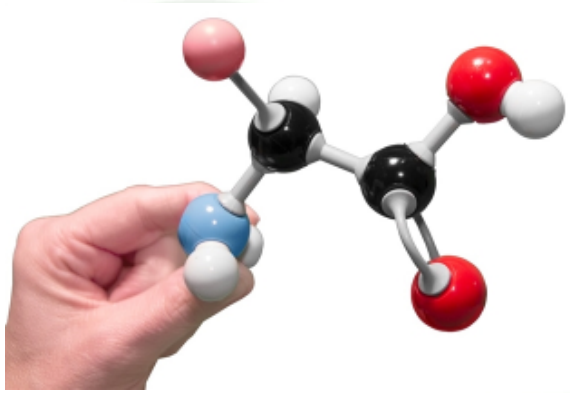
1. What makes a good model?
2. What can we learn from the Amino Acid Starter Kit?
3. What do you find difficult when you are teaching about protein structure/function?
4. Where do multidimensional models help with this topic?
5. How can you show protein chemistry, how shape influences function and how mutations change function with this model?

Amino Acids

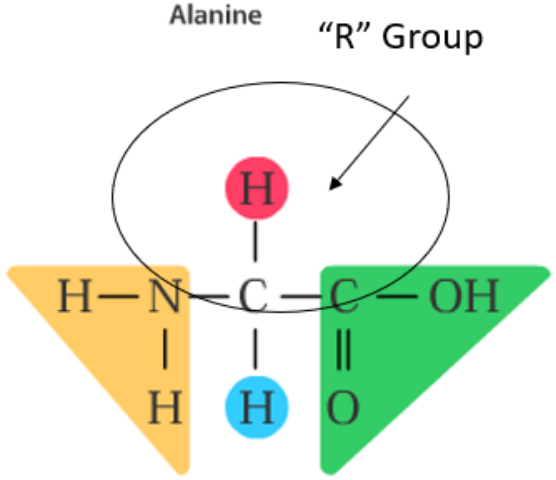
Each amino Acid has a different “R” Group.

Different elements at the “R” group provide Amino Acids with different shapes.

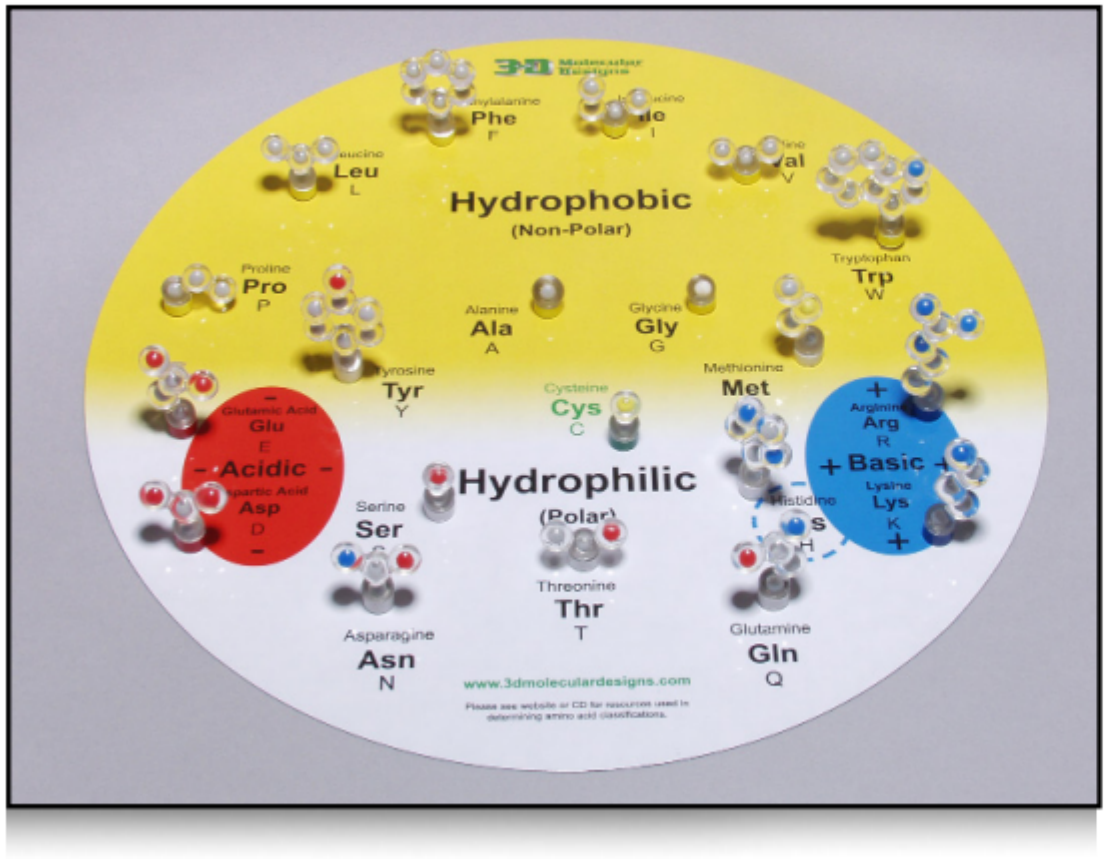




Alanine



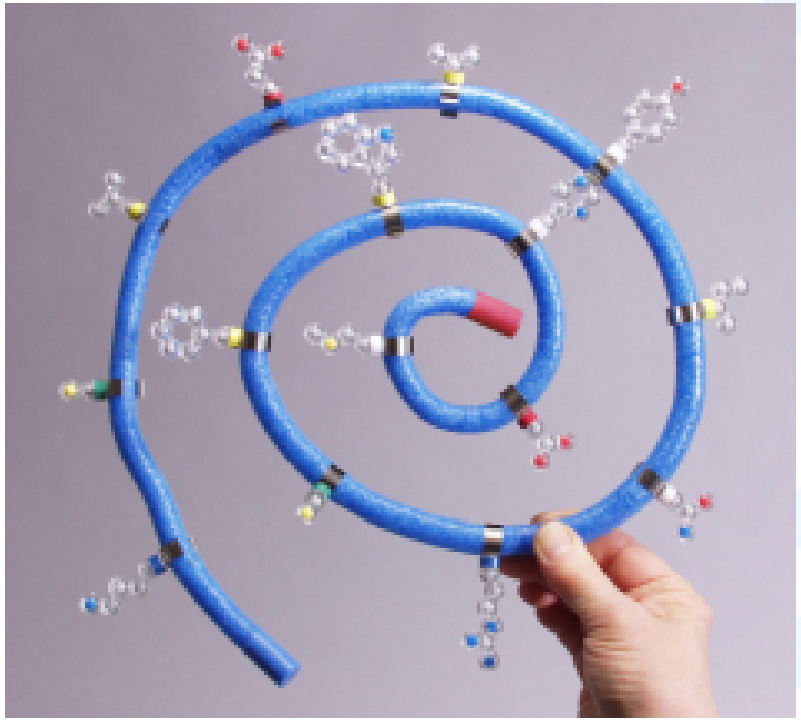
There are 20 different Amino Acids. – Like an alphabet of 20 letters, these amino acids make the protein “words”



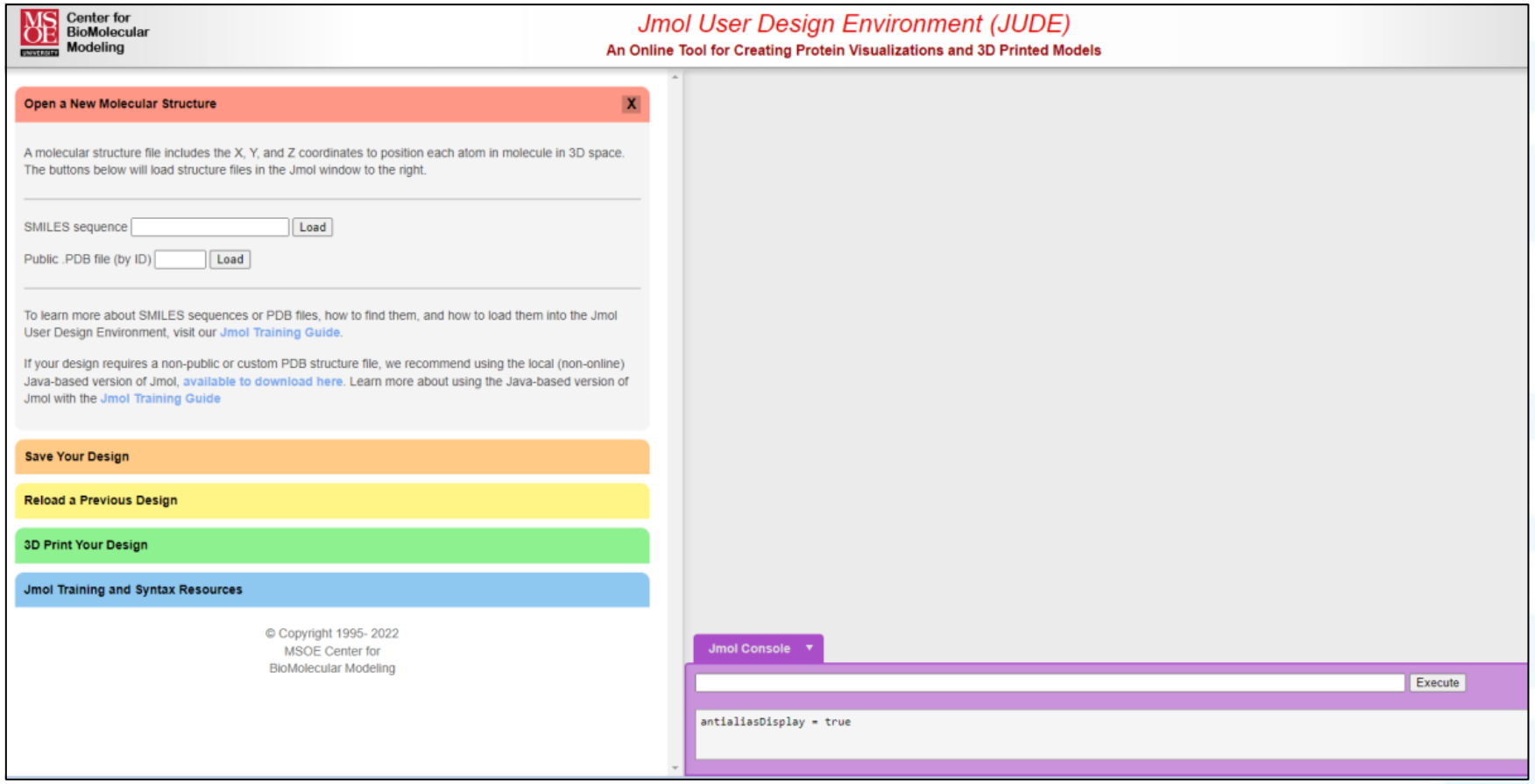
Place amino acid sidechain on the magnetic Chemical Properties Circle according to its chemical properties. You will need to consult the Amino Acid Sidechain List in your kit to find the name of each sidechain, so you can position it correctly on the circle.

Build your own protein

6 Hydrophobic sidechains
2 Acidic sidechains
2 Basic sidechains
2 Cysteine sidechains
1 Methionine sidechain
2 other Polar sidechains



Explore ANY Structure!



**********.centerforbiomolecularmodeling.org/modelingResources/jmolUserDesignEnvironment/#forward

Workshop NGSS Connections (and/or other applicable standards)

SEPs	CCCs	DCIs
Asking Questions and Defining Problems	Patterns	LS1.A: Structure and Function
Developing and Using Models	Cause and Effect: Mechanism and Explanation	
Constructing Explanations and Designing Solutions	Scale, Proportion, and Quantity	
Engaging in Argument from Evidence	Structure and Function	
Analyzing and Interpreting Data	Stability and Change	

Thank you!

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Summer Courses!

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THANK YOU!!

Remember the conference discount code: **FC23**

SURVEY

DNA with a Twist Tomorrow
Canandaigua Room at 3:15

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