



Yale-New Haven
Teachers Institute®

Curriculum Units by Fellows of the Yale-New Haven Teachers Institute
2014 Volume IV: Engineering in Biology, Health and Medicine

The Biochemistry of Drug Development: From Bench to Bedside

Guide for Curriculum Unit 14.04.07

by Lindsey Flanick

This unit is a high school chemistry unit that can be used to teach basic biochemistry through the lens of drug design and development. The unit begins with biochemistry basics, and students are introduced to amino acids and enzymes. Students will be introduced to the chemical structure of amino acids and the formation of peptide bonds to create polypeptides and protein chains. Next, students will learn about protein folding and the complex structures that proteins can have. At this point, students will learn about the important role structure plays in the function of each specific protein. This unit also addresses enzymatic function and the role enzyme shape plays in catalyzing chemical reactions. Once students have a basic understanding of biochemical principles, the unit addresses pharmaceutical design and development. This unit outlines the process of designing new pharmaceutical drugs and the importance of knowing protein structure and function when doing so. Additionally, the unit addresses the engineering design process and its uses in pharmaceutical development.

(Recommended for Chemistry, grade 11)

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