

## E0041

**Mammalian Cytochrome P450.** A. Amasino, W. Baatacharya, E. Betlach, H. Cronan, Y. Deng, S. Huang, B. Jackson, O. Judd, I. Lee, Y.Pu, H. Streckert, P. Vander Velden, G. Graper. Madison West High School SMART Team, Madison, WI 53726, Mentor: Dr. David Nelson, Univ. Wisconsin, Madison, WI 53706-1544, Consultants: Dr. Adnan Elfarra, Dr. Charles Czuprynski, Dr. Colin Jefcoate, Univ. Wisconsin, Madison, WI 53706-1544.

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Proteins are essential catalysts in chemical reactions that are necessary for life. Cytochrome P450s are a large class of proteins that are expressed in every living organism. They generally metabolize foreign compounds and make them less toxic. The reactant for P450 2C5 is a steroid, progesterone, which in the process of hydroxylation is transformed into a more hydrophilic molecule that can be either flushed from the body or changed into another product. The little steps involving this is actually quite complex and requires the efforts of two other proteins, NADPH Cytochrome P450 Reductase and Cytochrome B5, and a Heme group. The protein is located mostly in the endoplasmic reticulum membrane with small section that juts out. Because P450s are involved in reactions involving drugs and other toxins, it is important to study their function. Better understanding of P450s will improve the process of drug discovery and the ability to predict drug interactions, as well as developing the concept of "individualized medicine."