

Synthesis of 6-Ethenyldopamine for Analysis in SULT1A3

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Within the human body, there is an important class of enzymes known as sulfotransferases (SULTs). SULTs are responsible for the metabolic regulation of many endogenous compounds and xenobiotic substances through catalyzing the transfer of a sulfate group ($-\text{SO}_3^-$) from 3'-phosphoadenosine-5'-phosphosulfate (PAPS) to various substrate molecules. There are two main classes of SULTs: cytosolic SULTs and membrane-associated SULTs. Of the 13 known human cytosolic SULTs, SULT1A3 is of particular interest due to its affinity to sulfate catecholamines, like the neurotransmitter dopamine. Even though SULT1A3 shares over 90% sequence similarity with other SULTs, like SULT1A1, both select very different substrates. The goal of this study is to understand the molecular basis for SULT1A3's substrate selectivity. Computational results show that 6-ethenyldopamine has highly interesting binding characteristics and has therefore become the target of this research. The synthesis of 6-ethenyldopamine will be discussed.