PATHWAYS OF P450 REGULATION (P50-P52)


The Cytochrome P-450 enzyme mimic exhibits oscillating behaviour in the (L-a-dipalmitoylphosphatidyl choline vesicles, T=48 °C, [Rh]/[Mn] = 10) encoding these factors. These nuclear factors show elucidate the transcriptional activities of the nuclear reduction of the manganese(III) porphyrin, which decreases in going from negatively charged to zwitterionic vesicles considerable effect on the catalytic epoxidation activity of the mimic, and activates molecular oxygen, and transfers it to an alkene substrate electron donor, and a membrane system enclosing these components. The model was created by anchoring to a synthetic vesicle membrane both a manganese(III) porphyrin and a rhodium complex, which catalyzes hydrogen bond has already been revealed by us for various metal thiolate complexes. We synthesized novel P-450 iron(III) porphyrin model complexes. We synthesized novel P-450 iron(III) porphyrin model complexes.

CONTROL OF STEROIDOGENIC P450 GENE EXPRESSION BY A ORPHAN NUCLEAR RECEPTORS

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The adrenal cortex, testis, and ovary are major steroid hormone synthetic tissues in which steroidogenic P450s catalyze reactions from cholesterol to various steroid hormones. In recent studies, it has been investigated how Ad4BP/SF-1 and DAX-1 are implicated in the regulation of the steroidogenic tissue functions. In particular, extensive studies have been performed to elucidate the transcriptional activities of the nuclear factors and the transcriptional regulation of the genes encoding these factors. These nuclear factors show similar distributions in the steroidogenic tissues with a few exceptions, and show functional correlation. With respect to the regulation of these transcription factor genes, Ad4BP/SF-1 has been found to be implicated in the regulation of both genes. Ad4BP/SF-1 seems to function as a key factor for differentiation and maintenance of the steroidogenic tissue through regulating a variety of steroidogenic tissue specific genes.

CHEMICAL MODELS (P53-P54)

SUPRAMOLECULAR MODEL OF CYTOCHROME P-450
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A synthetic model of membrane-bound Cytochrome P-450 is described which incorporates the important features of the natural system, namely molecular oxygen as the oxidant, a metalloporphyrin as catalyst, an electron donor, and a membrane system enclosing these components. The model was created by anchoring to a synthetic vesicle membrane both a manganese(III) porphyrin and a rhodium complex, which catalyzes the sodium formate reduction of manganese(III). The rate-determining step is the formation of a rhodium(III) hydride species which reacts with manganese(III) to form manganese(II). The latter complex rapidly binds and activates molecular oxygen, and transfers it to an alkene substrate. The turnover numbers for a series of substrates lie in the same range as those observed in nature. The charge of the vesicle membrane has a considerable effect on the catalytic epoxidation activity of the mimic, which decreases in going from negatively charged to zwitterionic vesicles and then to positively charged ones. Under precisely defined conditions (L-α-dipalmitoylphosphatidyl choline vesicles, T=48 °C, [Rh][Mn] = 10), the Cytochrome P-450 manganese mimic exhibits oscillating behaviour in the reduction of the manganese(III) porphyrin.