

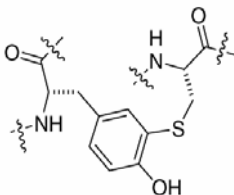
Structure and Reactivity of Type 2 Copper-Oxidases

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Amine oxidases catalyze the oxidative deamination of primary amines, and require both copper and 2,4,5-trihydroxyphenylalanine (TPQ) as cofactors. Galactose oxidase catalyzes the oxidation of galactose and several primary alcohols to aldehydes, and utilizes copper and a crosslinked tyrosine-cysteine radical. TPQ is produced via a novel six-electron oxidation of a tyrosine residue in a self-processing reaction, and the Y[•]-C radical of galactose oxidase is also the product of self-processing chemistry. By exploiting the structural and specificity variations displayed by amine oxidases from various principles that govern substrate specificity and inhibitor selectivity may be identified. Further such comparative studies may be very helpful in defining the mechanisms of oxygen activation and reoxidation of the substrate-reduced forms, which are catalytic intermediates. The results of spectroscopic, mechanistic, and crystallographic experiments along these lines will be presented. Results from experiments probing the influences of the active-site environment on the properties and reactivity of the Y[•]-C cofactor in galactose oxidase will also be presented.

Y-C



TPQ

