

Engineering nitrilase gene for the simultaneous improvement of oxidative and thermostability

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Nitrilases are an important class of hydrolases that convert nitriles to corresponding carboxylic acids and ammonia. Nitrilases are useful biocatalysts for the organic synthesis because their eco-friendly bioconversion allows clean and mild synthesis with high selectivity and yield. Biocatalytic hydrolysis of nitriles is attractive for various sectors like pharmaceutical, fine chemical, cosmetics and food. In the pharmaceutical sector it is used in manufacturing drug/ drug intermediates like atorvastatin, pregabalin, clopidogrel

etc. However, their applicability at industrial scale is restricted as this group of enzyme possesses certain drawbacks like low catalytic activity, their inability to act in oxidative stress condition and elevated temperature. The main objective of the present work is to address these problems via protein engineering. This approach has been employed to generate 'superior nitrilase variant' which can efficiently act under the optimised oxidative stress condition and also at elevated temperature as compared to the parental enzyme.