

Bacterial nitrilases and their regulation

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Appl Microbiol Biotechnol (2019) 103: 4679.
<https://doi.org/10.1007/s00253-019-09776-1>

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ABSTRACT:

Commercially, nitrilases are valuable biocatalysts capable of converting a diverse range of nitriles to carboxylic acids for the greener synthesis of chemicals and pharmaceuticals. Nitrilases are widespread in nature and are both important components of metabolic pathways and a response to environmental factors such as natural or manmade nitriles. Nitrilases are often grouped together on a genome in specific gene clusters that reflect these metabolic functions. Although nitrilase induction systems are still poorly understood, it is known that a powerful Rhodococcal transcription regulator system permits accumulation of intracellular nitrilase of up to 30–40% of total soluble protein in wild type *Rhodococcus rhodochrous* and host *Streptomyces* strains. Nitrilase expression inducer molecules encompass a broad range of aliphatic, aromatic and heteroaromatic nitriles, as well as some secondary and tertiary amides that are resistant to nitrilase degradation.