18th National and 3rd International Conference of Iranian Biophysical chemistry

هجدهمین همایش ملی و سومین همایش بین المللی بیوشیمی فیزیک ایران

25-26 Des, 2024, University of Hormozgan

۶-۵ دی ماه ۱۴۰۳، دانشگاه هرمزگان

Nanozyme, a new horizon in artificial enzymes

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Abstract

Nanozymes are nanomaterials with intrinsic enzyme-like properties. As an artificial enzyme, nanozymes take advantage of good stability, easy modification, designability, ease of preparation, and low cost. Nanozymes have been booming over the past decade because of their capability to address the limitations of natural enzymes such as low stability, high cost, and difficult storage. Along with the rapid development and ever-deepening understanding of nanoscience and nanotechnology, nanozymes hold promise to serve as direct surrogates of traditional enzymes by mimicking and further engineering the active centers of natural enzymes. In recent years, a great number of nanozymes have been fabricated. Nanozymes were synthesized in different spatial dimensions (0D, 1D, 2D, 3D). Moreover, over the past decade, multi-functional nanozymes have been developed for various applications. The nanozymes were applied for disease diagnosis, tumor microenvironment sensing, pathogen detection, drug detection, food detection, and environmental sensing. In this work, a short review on nanozymes, their mechanism and applications was provided.

Key words: Nanozyme, Artificial enzyme, Enzyme-mimetic, Catalyst.

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