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Addressing Neurodegenerative Disease: Nanozymes Showcasing Exceptional Antioxidant Performance

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According to the World Alzheimer Report, more than 46.8 million people were globally living with dementia in 2015, which costed the health care services up to $818 billion. Current trend indicates these numbers will double every 20 years, becoming a global health concern. Life sciences will be crucial for addressing this issue in an increasingly aging society.
The malfunction of the nervous system associated with several neurodegenerative disorders has been linked to the misregulation of free metal ions and oxidative stress. For example, in Alzheimer's disease, accumulation of copper and iron in beta-amyloid plaques is thought to be responsible for an increased oxidative damage in certain areas of the brain. Ongoing research is focused on the sequestration of these transition metals to avoid their participation in the formation of the protein aggregates, as well as on the reversion of their toxic oxidative activity to antioxidant activity.
A family of nanozymes capable of sequestering copper and iron has been synthesized and characterized. Solution studies and activity assays indicate that they can coordinate these metals at physiological pH, resulting in the formation of complexes able to mimic superoxide dismutase and catalase/peroxidase enzymes with remarkable performance.

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