

# Exploiting the bio-derivative organic materials for rechargeable batteries

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## Abstract

To meet the ever-increasing energy demands and sustainability requirements, next-generation battery systems must provide superior energy densities while employing eco-friendly components. Transition metal oxide-based materials have served as important high-energy-density battery electrodes over the past few decades; however, their further development is challenging as we approach the theoretical limits arising from their crystal structures and constituting elements. Exploiting materials from biological systems, or bio-inspiration, offers an alternative strategy to overcome the conventional energy storage mechanism through the chemical diversity, highly efficient biochemistry, sustainability, and natural abundance provided by these materials [1]. In this presentation, I will introduce our recent progress in biomimetic research focused on novel electrode material design for rechargeable batteries, exploiting redox-active molecules involved in the bio-metabolism and diverse bioderived materials. Successful demonstrations of energy storage using biomimetic materials that simultaneously exhibit outstanding performance and sustainability would provide insight toward the development of an eco-friendly and high efficiency energy storage system.

## References

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