

Structural Biology: Recent Advances & Innovations In vivo enzymology to reveal a key mechanism to maintain genome integrity



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Abstract

Preservation of genome integrity is of utmost importance for all living organisms. Several fine-tuned mechanisms have evolved to deal with DNA damages, which may arise not just from exogenous damaging agents but also under normal physiological conditions. DNA chemical modifications induced by various effects are highly numerous and diverse. Among these, modified bases often lead to mutations. We focus on the uracil moieties that can occur in the genome via cytosine deamination and thymine replacing misincorporations. The enzyme families involved in preventing the occurrence of the uracil mistake or excising the uracil base from DNA are investigated using a complex toolbox of structural, molecular and cell biology. High-resolution structures combined with in-depth functional analysis are also paired with transgenic models where specific mutations or other perturbations are introduced to assess in vivo structure and function. Models include human cell lines of various genetic origins, as well as *Drosophila*, zebrafish and mouse transgenic strains.

Biography

Vertessy is currently working as Full Professor and Head of Department at the Budapest University of Technology and Economics (BME), Hungary. She also leads a research group at the Institute of Enzymology, Research Center of Natural Sciences, Budapest, Hungary. Dr Vertessy received her PhD in Biological Sciences from the Eötvös Loránd University, Budapest. She completed her Masters in Biochemistry at the University of Chicago. She then worked at the Institute of Enzymology, and spent postdoctoral fellowships in Germany (Alexander von Humboldt fellowship) and in the US. She served as Associate Professor and Professor at the Budapest University of Technology and Economics. Dr. Vertessy has authored over 120 publications in various journals, including key articles in PNAS, PLoS Genetics, Nucleic Acids Research, Angewandte Chemie, etc., reflecting her research interests in structural and molecular biology of genome integrity. Dr. Vertessy serves as Scientific Editor at several journals and is associated with leading positions in international scientific associations.



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