

# JUDIT TÓTH



**HUN-REN Research Centre for Natural Sciences  
Institute of Molecular Life Sciences**

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## RESEARCH AREA

Our research focuses on two fascinating topics. One explores the survival strategies of *Mycobacterium tuberculosis*, the bacterium that causes tuberculosis. Using a non-infectious model system, we aim to understand how the bacterium responds to various environmental challenges and how antibiotic resistance can develop within it. Our other line of research examines how cells maintain their genetic information and the role that the building blocks of DNA—the nucleotides—play in this process. In these two areas, students can gain insight into the hidden mechanisms of molecular biology and make their own discoveries about the fundamental processes of cellular function.

## TECHNIQUES AVAILABLE IN THE LAB

In the lab, students gain hands-on experience with mycobacteria, stress and drug-response assays, DNA building block quantification, protein structure and enzyme analysis, and molecular biology techniques. They explore genome stability and cellular process dynamics, experiencing modern biochemical, microbiological, and cell biology research from the molecular level to whole-cell responses.

## SELECTED PUBLICATIONS

Molnár, D., Surányi, É. V., Trombitás, T., Füzesi, D., Hirmondó, R., & **Toth, J.** (2024). Genetic stability of *Mycobacterium smegmatis* under the stress of first-line antitubercular agents. *eLife* **13**: RP96695.

Molnár, D., Surányi, É. V., Gálik, N., **Tóth, J.**, & Hirmondó, R. (2024). Assessing the Impact of Bedaquiline, Clofazimine, and Linezolid on Mycobacterial Genome Integrity. *Biomolecules* **14**(11): 1451.

El Battioui, K., Chakraborty, S., Wacha, A., Molnár, D., Quemé-Peña, M., Szigyártó, I. C., Szabó, C. L., Bodor, A., Horváti, K., Gyulai, G., Bószé, S., Mihály, J., Jezsó, B., Románszki, L., **Tóth, J.**, Varga, Z., Mándity, I., Juhász, T., & Beke-Somfai, T. (2024). In situ captured antibacterial action of membrane-incising peptide lamellae. *Nat Commun* **15**(1): 3424.

Kazzazy, L., Mező, D., Nagy, K. K., Perey-Simon, V., **Tóth, J.**, Békési, A., Vértessy, B., & Varga, M. (2025). Noncanonical Nucleotides in the Genome Around the Maternal-Zygotic Transition. *Journal of experimental zoology. Part B, J Exp Zool B Mol Dev Evol* 10.1002/jez.b.23292. Advance online publication.