Séminaire externe

"What is the true chemical space of DNA and how to explore it ?"

Maintenance of genome integrity and fidelity of DNA replication are of key importance for living organisms. DNA damage recognition and repair pathways and the regulation of nucleotide pools act hand in hand to prevent DNA mistakes and preserve the correct genomic information. Due to the vital significance of these pathways, they also offer numerous targets to fight harmful cells, either pathogenic microbes or tumor cells. Inhibition of key proteins within pathways responsible for genome integrity is a frequently used chemotherapeutic strategy against infectious diseases and many forms of cancer [1,2]. Recently, it has been also observed that the chemical composition of DNA is much more complex than the traditional four-base alphabet, and several unusual bases are not just simple mistakes that need to be repaired but also present epigenetic signals. A clear and objective description of the true chemical composition of genomic DNA is hindered by lack of sequencing methods that are directly deciphering the actual bases, not just simplify these into the A, T, G, C context. Our research is focused on the physiological roles and metabolism of uracil-DNA that is also a causative factor in thymine-less cell death, an oft-used anticancer clinical strategy. To identify the molecular mechanism of thymine-less cell death and to analyze the intriguing roles of uracil-DNA, we also develop novel tools to pinpoint uracil residues in DNA in tumor cells of varied genetic background [3, 4]. These results allow an insight into communication between BER and MMR pathways of DNA repair. Funding: OTKA NKFIH K109486 and ICGEB CRP/HUN14-01.

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Invitée par Eva Jakab Toth

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Salle de conférence du CBM