

# LIFE SCIENCES

## seminar series

### Josef Jiricny

Institute of Molecular Cancer Research, University of Zurich,  
Switzerland

## Errors of DNA replication: their repair and consequences of their non-repair

**November 5, 2015**

**Thursday, 16:00 – 17:00**

Seminar room 132, pavilion A11  
University campus Bohunice

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The enzymes responsible for DNA synthesis during replication, polymerases delta and epsilon, are highly-accurate molecular machines that make an error only about every 10'000-100'000 nucleotides. This fidelity is insufficient to copy the genome of even the smallest bacterium, but the enzyme carry also an intrinsic proofreading activity, which improves their precision by further two orders of magnitude. However, to copy the human genome, replication fidelity has to be greater than 10<sup>9</sup>. This is achieved with the help of the mismatch repair (MMR) system, which detects non-Watson-Crick base pairs in DNA and excises the misincorporated nucleotide(s) specifically from the newly-synthesized strand.

In my presentation I shall discuss the biochemistry of MMR, as well as the consequences of its malfunction. I shall also discuss cases where MMR addresses DNA lesions that it should not, and show an example where the action of MMR helps introduce mutations into DNA rather than remove them - to our benefit.