Katedry genetiky a biochémie PriF UK
a občianske združenie *NATURA*

Vás pozývajú na 121. prednášku v rámci Kuželových seminárov:

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YING AND YANG OF G-QUADRUPLEXES FOR GENOME STABILITY

ktorá sa uskutoční **1. júna 2021** (utorok) o **16:00**

ako webinár: meet.google.com/pjt-tstf-vcr

http://www.naturaoz.org/seminare.html
http://www.naturaoz.org/KuzeloveSeminare.html

Katrin Paeschke, Ph.D.
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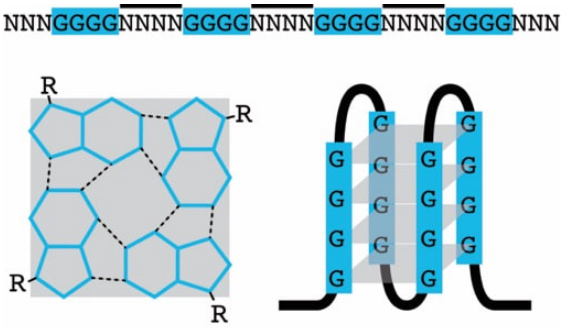
2003: Master of Biochemistry, University of Witten, Germany
2006: PhD in Biochemistry (Dr. rer. nat.) University of Witten, Germany
Thesis Advisors: Prof. Dr. Hans Joachim Lipps and Prof. Dr. Daniela Rhodes
2007-2011: Postdoctoral fellow at Princeton University, USA
2012-2017: Group leader at the University of Würzburg, Germany
2016-2017: Associate Professor at the University Medical Clinic Groningen (UMCG); European Research Institute for the Biology of Ageing (ERIBA)
2018-present: Professor (University Clinic Bonn, Department of Hematology and Oncology, Germany)
Recent prizes and awards: Walther-Flemming Medal of the German Society of Cell Biology (2015); ERC Starting Grant (2014); DFG Heinz-Maier-Leibnitz Price (2012).

Secondary structures such as G-quadruplexes (G4s) (see figure below) can form within DNA or RNA. They pose a dramatic risk for genome instability, because due to their stability they can block DNA replication and this could lead to DNA breaks. In certain cancer cells mutations/deletions are observed at G4s, if a helicase that is important for G4 unwinding is mutated. Nevertheless, G4s are also discussed to be functional elements for cellular processes such as telomere protection, transcription, replication, and meiosis. The Paeschke group uses a combination of genetic, molecular biological and genome-wide approaches to identify and characterize novel G-quadruplex (G4)-interacting proteins. Initial experiments are performed using yeast as a model organism and gained information will be transferred into human cells where results will be linked to human health. They have developed three novel screening techniques that enable us to identify novel G4 interacts. Candidate proteins are further validated in vitro as well as *in vivo*. Due to the connection of G4s and cancer the data obtained in the Paeschke lab will not only be important to understand G4 regulation and formation, but will also provide unique knowledge on the impact of G4 structures for genome stability and thereby for human health.



Selected Publications:

De Magis, A., Kastl, M., Brossart, P., Heine, A., **Paeschke, K**. (2021). BG-flow, a new flow cytometry tool for G-quadruplex quantification in fixed cells. *BMC Biol.* 19(1): 45.
De Magis, A., Götz, S., Hajikazemi, M., Fekete-Szücs, E., Caterino, M., Juranek, S., **Paeschke, K.** (2020). Zuo1 supports G4 structure formation and directs repair toward nucleotide excision repair. *Nat Commun*. 11(1): 3907.
Juríková, K., Gajarský, M., Hajikazemi, M., Nosek, J., Procházková, K., **Paeschke, K.**, Trantírek, L., Tomáška, Ľ. (2020). Role of folding kinetics of secondary structures in telomeric G-overhangs in the regulation of telomere maintenance in *Saccharomyces cerevisiae. J. Biol. Chem.* 295(27): 8958-8971.
Sauer, M., Juránek, S.A., Marks, J., De Magis, A., Kazemier, H.G., Hilbig, D., Benhalevy, D., Wang, X., Hafner, M., **Paeschke, K.** (2019). DHX36 prevents the accumulation of translationally inactive mRNAs with G4-structures in untranslated regions. *Nat Commun.* 10(1): 2421.
Wanzek, K., Schwindt, E., Capra, J.A., **Paeschke, K.** (2017). Mms1 binds to G-rich regions in *Saccharomyces cerevisiae* and influences replication and genome stability**.** *Nucleic Acids Res*. 45(13): 7796-7806.
Paeschke, K., Bochman, M.L., Garcia, P.D., Cejka, P., Friedman, K.L., Kowalczykowski, S.C., Zakian, V.A. (2013). Pif1 family helicases suppress genome instability at G-quadruplex motifs. *Nature* 497(7450): 458-462.
Paeschke, K., Capra, J.A., Zakian, V.A. (2011). DNA replication through G-quadruplex motifs is promoted by the *Saccharomyces cerevisiae* Pif1 DNA helicase. *Cell* 145(5): 678-691.