

Title: Understanding the roles of RNA:DNA hybrids in telomere integrity

Synopsis:

Our laboratory has recently discovered that the human proteins TRF1 and TRF2 regulate the establishment of RNA:DNA hybrid structures at telomeres (telomeric R-loops or tel-R-loops). We have also shown that in absence of a regulated interplay between these two factors, aberrant telR-loops accumulate and promote telomere and genome instability. We are currently studying what the physiological roles of telR-loops are, with emphasis on their regulation in normal versus cancer cells. In fact, we believe that their deregulation might contribute to cell transformation and therefore cancerogenesis. Our laboratory combines cell biology, molecular biology and in order to produce a comprehensive and mechanistic picture of this novel and fascinating aspect of telomere biology.

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Bibliography:

“TRF1 participates in chromosome end protection by averting TRF2-dependent telomeric R loops”. Y.W. Lee, R. Arora, H. Wischnewski, C.M. Azzalin. *Nat Struct Mol Biol* (2018) doi: 10.1038/s41594-017-0021-5.

“Telomeric Repeat Containing RNA and RNA surveillance factors at mammalian chromosome ends”. C.M. Azzalin, P. Reichenback, L. Khoriauli, E. Giulotto and J. Lingner (2007). *Science* 318: 798-801.

Remunerated or volunteer training: *volunteer*