**Compounds modulating functions of telomeric proteins TRF1 and TRF2**

Telomeric proteins, called shelterins, are important structural and functional elements protecting the ends of the chromosomes of eukaryotic cells, including human cells. The proper functioning of these proteins ensures proper cell division and protects the telomeric DNA ends from damage. The group of telomeric proteins includes, among others TRF1 and TRF2 proteins that play a structural role. They form homodimers that bind in a specific manner to telomeric DNA made up of G-rich 7 nucleotide tandem repeats. These proteins additionally interact with the TIN2 protein, which is a linker to the other structural elements of the telomeric complex. In cancer cells, TRF1 and TRF2 proteins hold particular importance, because the telomeres in these cells are shorter and any disturbance of the telomeric protein complex is lethal for these cells. Therefore, it has been postulated for several years that TRF1 and TRF2 proteins may be a new molecular target in anti-cancer chemotherapy. Our project is a continuation of an earlier project in which we have already managed to find the leading compounds blocking the interaction of TRF1 and TRF2 proteins with the TIN2 protein. These are two small-molecule compounds. In the present project, we would like to extend this research and find derivatives of these compounds with even better chemotherapeutic parameters. The project would involve the design of new derivatives *in silico* on the basis of already-known lead molecules. Then, these compounds would be synthesized and their properties determined *in vitro* (including blocking the TRF1/2-TIN2 interaction) and *in vivo* (biological effects in cell cultures). The project would be implemented in cooperation with the University of Gdańsk. The implementation of the project will allow research on very modern and important topics in which the applicant’s team already has achievements and is one of the world's pioneers. The results of the project will have also a chance to be published in prestigious international journals.