

BENCE NAGYMIHÁLY



National Academy of Scientist Education, 5th year

University of Szeged,
Albert Szent-Györgyi Medical School, 5th year

YEAR OF BIRTH

2001

FORMER SZENT-GYÖRGYI PUPIL

yes

RESEARCH UNIT

University of Szeged

SZENT-GYÖRGYI MENTOR

Tamás Martinek

JUNIOR MENTOR

Edit Wéber

SPECIALIZATION

molecular biology,
protein analysis techniques

SECONDARY SCHOOL

Miklós Radnóti
Experimental School,
Szeged

NAME OF TEACHER

Sándor Bán

LANGUAGES

English/intermediate

IMPORTANCE, AIMS AND POSSIBLE OUTCOME OF RESEARCH

Protein-protein interactions play a role in a number of pathophysiological processes, the manipulation of which can be therapeutically beneficial. Targeting extensive protein surfaces, however, is difficult with small molecules. For this purpose, artificial agents with higher interaction surface area, e.g. protein mimetics are required. Artificial self-assembling polymers (foldamers) can inhibit protein-protein interactions. The advantages of foldamers are that they have a designable and stable secondary structure, have a larger surface area than small molecule drugs, are resistant to proteases and are less immunogenic than antibodies. We are focusing on PCNA and on Rad6 proteins. PCNA is essential for DNA replication, however, its ubiquitination promotes error-prone DNA replication and allows cancer cells to survive. Rad6 plays a role in the ubiquitination of PCNA. Our goal is to inhibit PCNA ubiquitination with foldamers by blocking the key protein-protein interactions of PCNA and Rad6. We construct the foldamers by linking small-sized, protein surface mimetic building blocks, and innovative optimisation methods, such as dissipative systems are applied. Our compounds could serve as novel anti-tumour agents.

AMBITIONS AND CAREER GOALS

During my work and studies, my aim is to acquire as much theoretical and practical knowledge as possible, so that I can later become an active participant not only in the clinical field, but also in the scientific field. The opportunities provided by the National Academy of Scientist Education will enable me to acquire scientific knowledge on which I can build and guarantee my development in the future. I would like to adopt the concepts and perspectives I have learned here, so that I can later, in my individual work, come up with my own unique ideas to influence the development of the field and use my knowledge to help people beyond the sickbed.

HONORS AND PRIZES

2017 EUSO: silver medal
2019 iGEM HS division: bronze medal
2020; 2019; 2018 Dr. Árokszállás Zoltán Biology Competition 2nd; 5th; 7th place
2020 IBO qualifying competition: 5th place
2020 Bánkúti-prize
2020 Biology OKTV II. category: 37th place

PUBLICATIONS

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