

1. Raziskovalna organizacija (*Research organisation*):

Univerza v Ljubljani, *Fakulteta za farmacijo*
University of Ljubljana, Faculty of Pharmacy

2. Ime in priimek mentorja (*Name and surname of a mentor*):

Janez Ilaš

3. Področje znanosti iz šifrantu ARRS (*Primary research field*):

1.09 - Naravoslovno-matematične vede / Farmacija
1.09 - Natural sciences and mathematics / Pharmacy

4. Kontaktni e-naslov mentorja (*Contact of a mentor*):

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5. Kratek opis programa usposabljanja (*Short description of the program*):

SLO

Humana topoizomeraza II je aktualna tarča za načrtovanje protirakavih učinkovin. Strukturno je zelo podobna bakterijski girazi B.

Na osnovi obsežne knjižnice nanomolarnih zaviralcev bakterijske giraze B kot obetavnih protibakterijskih učinkovin in dveh kristalnih struktur omenjenih inhibitorjev v kompleksu z girazo B iz *E. coli*, se bo mladi raziskovalec posvetil razvoju ATP-kompetitivnih zaviralcev humane topoizomeraze II.

Poleg razvoja in optimizacije zaviralcev humane topoizomeraze II bo sistematično študiral tudi njihov vpliv na interakcije s sorodnimi tarčami, ki izkazujejo veliko podobnost v strukturi aktivnega mesta, kot je *heat shock protein 90* (Hsp90), zanimiva tarča za razvoj protitumornih in protivirusnih učinkovin.

Mladi raziskovalec bo delal v kreativnem okolju v mednarodne povezave široko vpete programske skupine, ki mu bo nudila idealne možnosti za njegov vsestranski znanstveni razvoj in nov izviren prispevek k znanosti na področju odkrivanja novih protitumornih učinkovin. Seznanil se bo z modernimi pristopi in orodji za načrtovanje učinkovin, njihovo kemijsko sintezo, metodami za njihovo karakterizacijo, metodami vrednotenja načrtovanih in sintetiziranih spojin na izoliranih encimih kakor tudi z metodami vrednotenja njihovega *in vitro* protitumorskega delovanja.

Ker so raziskave, pri katerih bo sodeloval mladi raziskovalec, vpete v mednarodne raziskovalne povezave, bo mladi raziskovalec tekom doktorskega študija s sodelovanjem na mednarodnih sestankih in kongresih pridobil tudi internacionalno dimenzijo znanstvenega delovanja in predstavljanja raziskovalnih rezultatov.

Izbrani mladi raziskovalec se bo vpisal na doktorski študij Biomedicina – znanstveno področje Farmacija na Univerzi v Ljubljani.

ANG

Human topoisomerase II is attractive target for the design of anti-cancer compounds. Structurally is very similar to bacterial gyrase B.

Based on the extensive library of nanomolar inhibitors of bacterial gyrase B as a promising antibacterial agents and two crystal structures of inhibitors in complex with gyrase B from *E. coli*, the young researcher will develop ATP-competitive inhibitors of human topoisomerase II.

In addition to the development and optimization of inhibitors of human topoisomerase II, he/she will be systematically studying their impact on interactions with related targets, that show high similarity in the structure of the active site, such as *heat shock protein 90* (Hsp90), an interesting target for the development of anti-cancer and antiviral substances.

The young researcher will work in a creative environment with broad international links, which will provide the ideal conditions for his/hers versatile scientific developments and the new original contribution to science in the discovery of new antitumor substances. He/she will get acquainted with the modern approaches and tools for drug design, chemical synthesis, and methods for characterization and evaluation of synthesized compounds on isolated enzymes as well with methods for their evaluation of *in vitro* antitumor activity.

Research is embedded in international research environment, therefore young researcher will, through participation in international meetings and congresses also acquire international dimension of scientific activity and presentation of research results, during doctoral studies.

The selected young researcher will be enrolled in the doctoral program of Biomedicine - scientific field Pharmacy at the University of Ljubljana.