Laboratory of Human Disease Multiomics at

Mossakowski Medical Research Institute of Polish Academy of Sciences in Warsaw, Poland

is seeking a PhD student

Project title: Oncogene competition - a new interplay mechanism of mutant p53 with CMYC and mutant KRAS in human cancers (with dr Dawid Walerych).

The project: Among the universal driver oncogenes are mutated *KRAS*, hyperactive *CMYC* and mutated *TP53*, last of which upon acquiring missense mutations switches from a tumor suppressor to a potent driver oncogene. It has been shown by our group and in various other studies that these and other oncogenic drivers cooperate and complement one another to promote cell transformation and progression of neoplasias. In the same time it is a paradigm that this cooperation and ability of each driver oncogene to be decisive in oncogenesis is different dependent on the molecular background.

During an ongoing project our group has discovered in cancer cell lines that an important dimension of the molecular background is an "oncogene competition" phenomenon – when one oncogene is taking-over or inhibiting the activity of another oncogene which results in reshaping of molecular programs of both oncogenes.

This phenomenon has never been described before in cancer research and requires a large-scale and mechanism study using normal/cancer cell lines, cancer organoid cultures and *in vivo* validation in mice.

Location and duration: Laboratory of Human Disease Multiomics established in 2018 in a biomedical institute with long traditions (http://www.imdik.pan.pl/en/), within the stimulating Ochota Biocenter campus environment in Warsaw Poland. The location is the **Mossakowski Medical Research Institute Polish Academy of Sciences in Warsaw, 02-106 Poland, Pawinskiego street 5.**

The project and participation in the PhD School of Translational Medicine is planned for 4 years, until 2026, starting mid-academic year in March 2023 or regularly - in October 2023 (both application types are possible, see: "How to apply"); PhD stipend - 5000 PLN gross/month. The project is multidisciplinary, biomedical, includes collaborations and will allow to learn and develop skills of open and flexible scientific approach.

Requirements:

- M.Sc. degree in biology, biotechnology, biomedicine or related life sciences topic.
- Good command of English and practice in scientific writing/presentation of data in English.
- Basic knowledge of molecular biology techniques (e.g. qPCR, RNA handling, western blot etc.) and/or basic cell culture methods.
- Any knowledge of 3D/organoid cultures or mouse xenograft techniques will be an additional advantage.
- Possibility to work full-time in science, in Warsaw, Poland for the 4 following years.

How to apply: If you want to apply for March 2023 - please send the document set required by the PhD school (https://www.cmkp.edu.pl/ksztalcenie/wspolna-szkola-doktorska/rekrutacja) to **szkola.doktorska@cmkp.edu.pl**.
If you consider application for October 2023 – please send the CV with contact to the M.Sc. supervisor to dr Dawid Walerych: dwalerych@imdik.pan.pl. Do not write a separate motivation letter – if you want to o justify your application (not required), do so briefly in the e-mail.

Related reading (representative of our research and review papers):

The molecular network of the proteasome machinery inhibition response is orchestrated by HSP70, revealing vulnerabilities in cancer cells. **Oroń M, Grochowski M, Jaiswar A**, **Legierska J**, Jastrzębski K, Nowak-Niezgoda M, Kołos M, Kaźmierczak W, Olesiński T, Lenarcik M, Cybulska M, Mikula M, Żylicz A, Miączyńska M, Zettl K, Wiśniewski JR, **Walerych D.*** Cell Reports **2022** Sep 27;40(13):111428.

A Driver Never Works Alone - Interplay Networks of Mutant p53, MYC, RAS, and Other Universal Oncogenic Drivers in Human Cancer. **Grzes M, Oron M, Staszczak Z, Jaiswar A**, Nowak-Niezgoda M, **Walerych D.*** Cancers. **2020** Jun 11;12(6):1532.

Proteasome machinery is instrumental in a common gain-of-function program of the p53 missense mutants in cancer. **Walerych D**, Lisek K, Sommaggio R, Piazza S, Ciani Y, Dalla E, Rajkowska K, Gaweda-Walerych K, Ingallina E, Tonelli C, Morelli MJ, Amato A, Eterno V, Zambelli A, Rosato A, Amati B, Wiśniewski JR, Del Sal G.* Nature Cell Biology, **2016** Aug;18(8):897-909.