CeNT-2.1-2021

Director of Centre of New Technologies of the University of Warsaw, with the Project Leader, announce opening of the competition for the position of 2 PhD Students in the Laboratory of the Molecular Biology of Cancer- Centre of New Technologies of the University of Warsaw.

JOB OFFER

Position in the project:	PhD Student
Laboratory:	Laboratory of the Molecular Biology of Cancer
Scientific discipline:	Life sciences
Keywords:	Breast cancer, metastasis, EMT, cancer stem cells, circulating tumor cells
Job type (employment contract/stipend):	stipend
Part-time/full-time:	Full time
Number of job offers:	1
Remuneration/stipend amount/month:	4200PLN gross/m. initial stipend for one year with possibility of renewal for up to 52m
Position starts on:	1 December 2021 or as soon as possible afterwards
Maximum period of contract/stipend agreement:	52 months
Institution:	Centre of New Technologies, University of Warsaw
Project leader:	Dr hab. Agnieszka Kobielak, Associate Professor
Project title:	Transcriptional and functional characterization of invasive breast cancer cells isolated using novel in vivo reporter system.
Competition type:	OPUS 19
Financing institution:	NCN
Project description:	Highly heterogeneous breast cancers are the most commonly diagnosed cancer in women worldwide. Majority of breast cancer related deaths are a consequence of inoperable metastatic disease. Therefore, understanding how tumor cells invade other tissues and contribute to the heterogeneity and generation of more resistant to treatment cancer cells are fundamental challenges in cancer research. Carcinomas are the cancer type that arise from epithelial tissues, that normally are well organized with cells connected tightly with each other. Epithelial-to-mesenchymal transition (EMT) is a dynamic process that endows epithelial cells with enhanced motility and invasiveness by dynamic changes like loss of connections between epithelial cells and increased motility as a single cell, allowing them to spread and invade surrounding tissue. One important aspect of EMT's role in cancer is that EMT contributes to the generation of circulating tumor cells (CTCs). CTCs are tumor cells released into blood and/or

	lymphatic vessels that can circulate in the human body, which are predestined sources of metastasis as the "seeds". EMT was also suggested being important in the formation of so-called cancer stem cells, cells which are more resistant to therapies and can survive in the body for long periods of time and give rise to new tumor and disease recurrence. Although the contribution of EMT to initial tumor cell invasiveness has been confirmed, its role in whole process of metastasis remains debated. Most importantly it remains a challenge to observe EMT in vivo in human carcinomas. One major difficulty is caused by the transient, reversible nature of EMT, since cancer cells which went through EMT, invaded tissues and spread to the blood stream, once at the distant organ, can go back to epithelial state and form metastatic tumor growth. Because only a small minority of carcinoma cells may be invasive and undergo an EMT in primary tumors, the functional characterization, cancer stem cells potential and changes in gene expression in such cells can be masked by the bulk of non-metastatic cells. Detecting such transient cells will be critical to assess the contribution of EMT to the behavior of high grade carcinomas. Another major challenge in such studies is to identify reliable molecular markers to define cells that are undergoing EMT in human tumors. Data from our laboratory indicate that relatively novel protein catulin is highly expressed in different types of invasive carcinoma cells. In vitro data indicate that an up regulation of catulin expression correlates with the transition of tumor cells from an epithelial to mesenchymal morphology and removal of catulin in human cancer cell lines dramatically decreases the migratory and invasive potential of those cells. We also reported that catulin is highly expressed in the malignant human breast cancers and correlates with aggressive behavior of those tumors. As α-catulin expression and function correlates with early onset of tumor cell invasion, we developed a reporter system, using catulin regulatory element and fluorescent protein, which will allow us to mark, track and isolate a small minority of carcinoma cells that may be invasive and undergo an EMT in primary tumors as well as give rise to CTCs. Analysis of those cells will lead to characterization of early detection markers of invasion and also understanding of early signaling pathways involved in tumor invasion and more importantly to development of targeting strategy against invasive cancer stem cells. We also established three-dimensional tumor spheroid-based functional assays for newly characterized targets validation. This functional test combined with data obtained using our reporter system will give us a strong indication of potential new markers of invasion and novel targets for anti-metastasis therapeutics.
Key responsibilities include:	-to commit adequate time and effort to the project; - to display initiative in identifying and resolving problems relating to the research; - to manage their work efficiently and increase the visibility through the publications;
Profile of candidates/requirements:	The competition is open for persons who meet the conditions specified in the regulations on the allocation of resources for the implementation of tasks financed by the National Science Centre for Opus 19 grant. **Important:** To join the project, the successful candidate needs to have a PhD student status at Polish university either in a PhD program or in a Doctoral School (e.g., at University of Warsaw - the Doctoral School of Exact and Natural Sciences https://szkolydoktorskie.uw.edu.pl) **Required qualifications:** -MSc in biology or related fields or MD (or student of the last year of MSc/ MD studies), -Good knowledge of English, -Team work skills. -Experience in laboratory work: gel electrophoresis, PCR, RT-PCR, q-PCR, DNA/RNA/Protein extraction and purification, DNA cloning,

	lentiviruses, western blot, cryo- and paraffin- sectioning, immunofluorescent and immunohistochemistry staining, microscopy: fluorescent and confocal laser scanning microscopy, mammalian cell culture, **Additional qualifications:** FACS sorting, laboratory animals - mice handling, work with breast cancer models -Knowledge of Adobe Photoshop, Adobe Illustrator, PowerPoint,
Required documents:	1. Cover letter describing Candidate motivation 2. Current curriculum vitae 3. Copy of document confirming the PhD student status (to be provided at the latest on the date of employment in the research project) 4. Signed information on the personal data processing 5. Copy of MSc (MD) certificate (to be provided at the latest on the date of employment in the research project). 6. Two or more letters of recommendation from a scientist who is familiar with the Candidate (submitted directly to email address below)
We offer:	- work in active research team in an excellent scientific environment - comprehensive training in molecular and cell biology and cancer development and progression -participation in scientific seminars and conferences - a competitive stipend (4200 PLN gross /month) -stipend agreement for the period of maximum 52 months
Please submit the following documents to:	a.kobielak@cent.uw.edu.pl (entitle your email "PhD POSITION").
Application deadline:	31 October 2021
Date of announcing the results:	15 November 2021
Method of notification about the results:	email