

Institute of Bioorganic Chemistry  
Polish Academy of Sciences  
and  
Maria Skłodowska-Curie  
National Research Institute of Oncology  
Poland

### **Expression of interest**

Call/s:

HORIZON-MISS-2021-CANCER-02-01: Develop new methods and technologies for cancer screening and early detection (poorly understood cancers and cancer subtypes, including in children and adolescents)

HORIZON-MISS-2021-CANCER-02-03: Better understanding of the impact of risk factors and health determinants on the development and progression of cancer (breast, cervical and colorectal cancer)

Expected Outcome: Cancer patients' mortality is primarily caused by aggressive metastatic disease progression, rather than the primary tumor. Despite the progress in surgical techniques and oncological diagnosis, in some cases, there is not possible to predict the risk of progressive disease and consequently undertake proper treatment strategies. This is especially true for tumors with a high probability of metastasis and significant biological heterogeneity. Therefore, molecular prognostic factors are becoming increasingly important as a prognostic supplement filling the gaps left by imprecise classical prognostic factors. Reliable identification of molecular prognostic factors would allow indicating a group of patients requiring more aggressive treatment, thereby improving the survival rate.

Interested in: Participation in patients' enrolment and material collection, performing high throughput multi-omic (genomic, transcriptomic, proteomic, metabolomic, lipidomic) studies for searching of cancer prognostic factors, integrative analyses of clinical and molecular data using computer modeling, AI, and machine learning.

Experience: Consortium formed by two institutions: Maria Skłodowska-Curie National Research Institute of Oncology Gliwice Branch and Institute of Bioorganic Chemistry Polish Academy of Sciences has many years of experience in omics-based biomedical research using next-generation sequencing and mass spectrometry techniques, documented by numerous publications. This includes experience in working with tumor tissue, body fluids, cancer-derived cell cultures, small extracellular vesicles, and using platforms based on molecular biology, sequencing, mass spectrometry techniques, and advanced data analysis methods. Both team members have the necessary knowledge and experience in the realization of translational research projects (including established logistics for collecting and processing a large number of clinical samples). In cooperation with European Centre for Bioinformatics and Genomics and Poznan Supercomputing and Networking Center they create the MOSAIC platform that uses artificial intelligence to integrate and analyze multi-omics and clinical data to obtain new knowledge and tools for commonly available, personalized prophylaxis, diagnostics, and medical therapy.

Scientific and research facilities:

- access to unique medical datasets and collections of clinical material (breast cancer, colorectal cancer, head and neck cancer, melanoma, and other major types of cancer treated in a large comprehensive cancer center),
- available knowledge and infrastructure for multi-omic biomarker-oriented studies based on next-generation sequencing and mass spectrometry, including independent Acquisition (DIA)-based proteomics, HRMS shotgun lipidomics, PASEF technology, 2D gas chromatography, Mass Spectrometry Imaging,
- available knowledge and infrastructure for molecular studies based on single cells, extracellular vesicles, and animal models, including ImageStream nano-flow cytometry and super/nano resolution fluorescence microscopy.

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