



**JOINT TRANSNATIONAL CALL 2016:****"Minimally and non-invasive methods for early detection and/or progression of cancer"****PARTNER REQUEST/COLLABORATION OFFER**

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YES



SEARCH FOR A COLLABORATOR

IF YOU ARE LOOKING FOR A PARTNER IN YOUR SUGGESTED PROPOSAL, PLEASE SPECIFY ALSO THE NEEDED EXPERTISE

Project proposal

Project title (draft):

Short description of the project in preparation and of the consortium; description of the areas of expertise needed (Max. 2000 words):



OFFER FOR COLLABORATION

IF YOU PROPOSE YOURSELF AS A PARTNER IN A CONSORTIUM, PLEASE DETAIL YOUR EXPERTISE

Short description of the areas of interest and expertise (Max. 2000 words):

The LIES Group at TUL (lies.p.lodz.pl), headed by Professor Piotr Paneth, focuses on the use of isotope effects in the study of chemical and enzymatic systems. Our long-term objective is to understand mechanisms of these processes in order to use isotope effects as a guidance for rational drug design. Our studies include both; computational prediction of kinetic and equilibrium isotope effects as well as their experimental determination.

Our laboratory is well equipped for both computational modelling and isotopic analysis. For specialized QM/MM calculations we use our own servers while routine computations are carried out in national computing centers. In terms of isotopic analysis we have Sercon 20-21 isotope ratio mass spectrometer that can routinely measure isotopic composition of carbon, nitrogen and sulfur from a single sample. Furthermore, we have close ties with the laboratory for isotopic analysis at regional BioNanoPark that is equipped in isotope ratio mass spectrometer MAT 253, which allows for additional isotopic analysis of oxygen and hydrogen as well as Bruker 500 MHz NMR spectrometer equipped particularly for position-specific isotopic analysis of hydrogen (SNIF-NMR) and carbon (irm-NMR).

While in past we have addressed only basic questions of reactivity in recent years we focus also on the application of isotopic fractionation, that results from isotope effects, in practice for authentication of food products (e.g., ethanol, coffee, honey) as well as in medical diagnostics.

In terms of medical diagnostics we have started to evaluate isotopes as markers of cancer presence and progress. Initial findings on Wilms' tumor have been communicated:

"Hepatoblastoma Biology Using Isotope Ratio Mass Spectrometry: Utility of a Unique Technique for the Analysis of Oncological Specimens" Postępy Hig. Med. Dosw. (Advances in Hygiene and Experimental Medicine) 70, 797-802 (2016)

"Different patterns of isotopic fractionation as the mechanisms related to the fate of neural-crest derived and liver tumours at the developmental age" Katarzyna Taran, Tomasz Frączek, Łukasz Antoszczyk, Anna Sitkiewicz, Piotr Paneth, Józef Kobos Pathology and Oncology Research (2016) in press

"The first investigation of Wilms' tumor atomic structure – nitrogen and carbon isotopic composition as a novel biomarker for the most individual approach in cancer disease" Katarzyna Taran, Tomasz Frączek, Anita Sikora-Szubert, Anna Sitkiewicz, Wojciech Młynarski, Józef Kobos, Piotr Paneth Oncotarget 7, 76726-34 (2016)

The results for neuroblastoma are being prepared for publication. We offer our collaboration under a proposal to the call "Minimally and noninvasive methods for early detection and/or progression of cancer" in the area of development of these isotopic markers.