Project 1.8. Cell adhesion molecules as regulators of tunneling nanotubes (TNTs) formation and function in leukemia microenvironment

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Background:

The interactions between cancer cells and their microenvironment are crucial for the biology of cancer. Cell-cell communication within the leukemia microenvironment provides a suitable niche and conditions for cancer cell growth and survival as well as development of resistance. Recently, tunneling nanotubes (TNTs) have been considered as a new way of direct cell-cell contact and communication, mediating transfer of different cargos between two distant cells. Strong evidence suggest their critical role in the regulation of cell-cell crosstalk and signaling within the cellular networks. Our previous studies showed that TNT structures are formed between stromal and leukemic cells, and that transfer of membrane vesicles and sets of proteins from stroma to leukemia correlates with increased resistance to imatinib – the first line treatment drug (Kolba et al., 2019). Even if intensive studies are undergoing, the general regulators of TNT formation are not known. Moreover, the specific inhibitor of TNT formation and regulatory mechanisms of cargo transfer in the leukemia microenvironment have not been developed, what might be a base for novel therapeutic strategy.

Aim:

Our goal is to investigate role of adhesion molecules in generation and function of direct cel-cell interactions – tunneling nanotubes (TNTs) in leukemia microenvironment, also in the context of therapy resistance. We plan to utilize in vitro models, including co-culture and 3D cell cultures and in vivo mice models as well as broad spectrum of flow cytometry and imaging techniques, cellular and molecular biology as well as advanced proteomics studies.

Part of planned studies will be conducted during external training abroad

Requirements:

- master degree (or equivalent) in biological sciences

- passion and high motivation for scientific research documented by trainings and laboratory experience in scientific institutions

- research achievements

- experience in molecular biology, microscopy and/or cytometry

- ability to work with mice models (experience/permission will be additional advantage)
- fluent English