Medical University of Graz

Characterization of long non-coding RNAs in triple negative breast cancer

Summary

Martin Pichler, Division of Oncology, Department of Internal Medicine, Medical University of Graz, Austria

Supervisor:	Prof. Dr. Martin Pichler
Availability:	This position is available.
Offered by:	Medical University of Graz
Application deadline:	Applications are accepted between August 03, 2022 00:00 and September 20, 2022 23:59 (Europe/Zurich)

Description

Background:

Breast cancer is the most common diagnosed human cancer in women worldwide. Although several patients are cured by surgery and neo-/adjuvant treatment modality, some of them develop metastatic disease or are primarily diagnosed with metastatic breast cancer. In general, breast cancer is very heterogeneous in terms of underlying genetics and biology, treatment strategy and patient #s clinical outcome. A lack of estrogen, progesterone and HER2/neu receptors on cancer cells leads to the diagnosis of “triple negative breast cancer (TNBC)”, the most aggressive subtype. Non-coding RNAs are defined as trancripts that fullfill their function without translation into a respective protein. The aim of this project is to characterize novel long non-coding RNA in TNBC with a special focus on cancer stem cell features

Hypothesis and Objectives:

The central hypothesis of this proposal is to determine the role of long non-coding RNAs in TNBC biology and by doing so, discover novel therapeutic vulnerabilities. First, long non-coding RNAs relevant in breast cancer biology will be tested for molecular interaction partners with a special focus on druggable proteins/signaling pathways including a high-troughput compound screening approach. Second, we will test in collaborative efforts RNA-therapeutics in combinatorial approaches for their therapeutic potential in this deadly disease in vitro and in vivo.

Methodology:

Methods in RNA biology, RNA-protein interactions, cell culture, animal models including xenografts and patient-derived xenografts, high-troughput compound screening, RNA therapeutics

References:

ALYREF, a novel factor involved in breast carcinogenesis, acts through transcriptional and post-transcriptional mechanisms selectively regulating the short NEAT1 isoform.
Klec C, Cell Mol Life Sci. 2022 Jul 1;79(7):391
MiR-1287-5p inhibits triple negative breast cancer growth by interaction with phosphoinositide 3-kinase CB, thereby sensitizing cells for PI3Kinase inhibitors.

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Schwarzenbacher D, et al. Breast Cancer Res. 2019 Feb 1;21(1):20.

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