CRISPR screens to identify genes promoting invasiveness of cancer cells

Master project
Department of Medicine
Karolinska Institutet
Autumn 2022 (or Spring 2023)

Background:
Malignant cancer cells have the property of disseminate in the body through the process of metastasis. Since metastatic tumors is the main killer of cancer patients, understanding the process of metastasis is critical for developing new drugs that specifically can inhibit metastasis. A critical property of metastatic cells is the ability to intravasate through the basement membrane of epithelial tissues, and thereafter to disseminate through the circulation and thereby establish new tumors.

In this project the master student will use pooled CRISPR activation (CRISPRa) screens to identify genes that drive invasiveness of cancer cells. The student will first perform an in vitro screen, which includes generating a gRNA library, transduction of cancer cells, invasiveness assay and identification of enriched gRNA by next generation sequencing.

Aims and purpose:
The principal aim of this project is to identify genes that regulate invasiveness of cancer cells. This with the purpose of identifying new druggable pathways that can be targeted to inhibit metastasis of cancer cells. The specific aims are:
-To identify genes that promote invasiveness in vitro
-To validate the identified genes in vitro (and ideally in vivo using a metastasis model.)

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