

Project title

INVESTIGATIONS OF CANCER STEM CELLS IN THE BRAIN CANCER GLIOBLASTOMA

Research area:

CANCER/ONCOLOGY

Brief description

Glioblastoma is the most common and deadly primary brain cancer. Our research aims at identifying mechanisms governing progression and recurrence, with focus on the cancer stem cells. We use patient-derived cell cultures and mouse models, and the goal is to find novel therapeutic targets in glioblastoma.

Aim

The aim is to identify new mechanisms underlying the disease progression, recurrence and therapy resistance of cancer stem cells in glioblastoma, with the goal to find targets to which novel therapies can be developed.

Background

Glioblastoma is the most common and deadly primary brain cancer to which there is no cure. Current therapy aims at removing as much of the tumor cells as possible to prolong life, but the tumor inevitably comes back due to the inability of the treatment to efficiently reach all cancer cells, in combination with a high capacity of the glioblastoma stem cells (cancer stem cells of glioblastoma) to develop therapy resistance. Glioblastomas are also highly heterogenous which is an additional challenge to therapy development. Patients that by histopathology are inseparable can be divided into subgroups based on the molecular properties of their cancers, but these subgroups have no clinical relevance.

Our research is focused on understanding the basic biology of the glioblastoma stem cells and the underlying reasons for their high inter-patient heterogeneity and resistance to treatment. We do that by investigating the influence of the cell of origin for glioblastoma development and the cancer stem cell properties and have in previous studies identified a number of candidate genes of importance for glioblastoma stem cell properties, including their sensitivity to treatment. By investigating these (and other aspects) we hope to identify novel subgroups of patients that display common cancer mechanisms to which new therapies can be developed.

Project plan

All projects in my group deal with investigating basic mechanisms regulating glioblastoma and in particular the therapy resistant glioblastoma stem cells. We perform most investigations in cultured cancer stem cells that we have set up from patients or mice with glioblastoma, or in vivo using well characterized and relevant mouse models of glioblastoma development. To investigate consequences and mechanisms the glioblastoma stem cells are genetically modified by knocking down/out or overexpressing candidate genes before they are analyzed with different methods in

culture or in vivo. On the generated tissues and cells we use tissue-, cell- and molecular biology techniques to identify pathways of importance for cancer stem cells. The use of both mouse models and patient-derived cells assures the relevance and significance of our projects.

If you are a highly motivated student interested in cancer biology, do not hesitate to contact me for more information on specific projects available in my group.

Contact details

Lene Uhrbom, PI

Uhrbom research group / Neuro-oncology

Email: lene.uhrbom@igp.uu.se

Phone: 018-4715063