POSITION

1. Project Title/ Job Position title:

Hypoxia as a contributor to oncogenic transformation and their relationship with cellular reprogramming.

2. Area of Knowledge:

Life Sciences

3. Group of disciplines:

Human Biology, Microbiology, Genetics, Cell Biology, Genomics and Proteomics, Biochemistry

4. Research project/ Research Group description

Cellular reprogramming and oncogenic transformation are related processes whose mechanisms can be elucidated using metabolic manipulation models. In the classic oncogenic foci formation, fibroblast transduction with Klf4 and cMyc promotes unlimited self-renewal while, for cellular reprogramming, it is necessary to add Oct4 and Sox2 as well. Other similarities include the metabolic shift to glycolysis, mitochondria numbers and the epithelium-to-mesenchymal transition.

Chronic hypoxic patients have a higher incidence of tumors. No common cause has been described yet to explain this remarkable fact. It can be due to the fact that hypoxia induces larger numbers of Cancer Stem Cells. The group aims to test whether the physiologic hypoxic conditions make the cells from these patients more prone to undergo cellular reprogramming and/or oncogenic transformation.

To this end, the idea is to induce cell reprogramming and oncogenic transformation in cells from patients with chronic hypoxia as well as healthy controls in parallel. The efficiency of the transformation between them and in conditions of normoxia or hypoxia will be compared. Next, through RNA-seq and Chip-seq, similar and divergent molecular mechanisms involved in cell reprogramming and oncogenic transformation by metabolic resetting will be discerned.

The expected results would establish new therapeutic targets on which cancer cells depend for their survival. Finally, the possible use of hyperoxia will be explored as a preventive of in vivo transformation in immunodeficient mice.

IdiPAZ's Cellular Engineering Group is led by María Paz de Miguel. Its general focus is to ascertain the mechanisms responsible for converting a differentiated cell into a pluripotent cell. At the same time the group wants to understand how these mechanisms establish a relationship between reprogramming and oncogenic transformation in order to use divergent pathways governing these processes in both early diagnosis and treatment

5. Job position description

Role: The candidate will be in charge of performing the experimental activities of the project, in collaboration with other members of the group, in order to explore the hypothesis linking hypoxia and cancer arising both in vitro and in vivo. He/she will be trained accordingly and mentored through the completion of his/her PhD thesis.

Responsibilities

Set up and perform experiments, maintain experimental resources (as cell lines, reagents, etc.) according to protocols, analyze & interpret results and contribute to the development of experimental strategies with accuracy and honesty.

Keep updated the laboratory notebook and properly store and manage the data produced during the project.

Collaborate with colleagues and participate in team activities (such as meetings, seminars, workshops, etc.) across the research group and wider scientific community while keeping up to date with current knowledge and recent advances.

Participate in knowledge exchange with both society and industry, to promote the value of research in public health and to contribute to the dissemination of his/her research results in the principles of EU's Open Science policy.

Undertake any other duties of equivalent standing as assigned to him/her.

Skills

Degree in Life Sciences (Biology, Biochemistry, Biotechnology or similar).

Experience with laboratory animals is desirable (FELASA accreditation).

Experience in cell culture is desirable.

Motivation, critical thinking and problem-solving oriented skills.

Good interpersonal skills, including team working.

Good communication skills, willingness to engage in public presentations and ability to transmit complex concepts in a clear way.

Good workload management skills, including both initiative and flexibility.

GROUP LEADER

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http://www.idipaz.es/PaginaDinamica.aspx?IdPag=312&Lang=EN