



Propuesta de Trabajo Fin de Máster
Año académico 2020-2021
Máster en Métodos computacionales en ciencias

Project Nº 48 ASIGNADO

Título: Genomic and bioinformatic analysis of transcriptomic changes that govern brain metastasis and response to radiotherapy in lung cancer.

Departamento/ Laboratorio en donde se desarrolla el Proyecto:
Laboratorio 2.02, Programa de Tumores Sólidos, CIMA

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Resumen e ilustración:

Brain metastases (BM) in lung cancer are diagnosed in 10-40% patients and are an important cause of morbidity. Diagnosis of BM is rising, mainly due to improvements in survival rates and neuroimaging techniques. Radiotherapy is the mainstay treatment for combating metastatic BM, with stereotactic radiosurgery (SRS) as the treatment modality that uses steep dose gradient with high precision, but radionecrosis (RN) is a common adverse effect associated with SRS. In order to improve survival in patients with BM, new therapeutic strategies are needed. We have developed mouse models of lung cancer cells metastatic to the brain that are responsive to SRS. With the goal of identifying molecular pathways that may be involved in resistance to this therapy, we will conduct RNA-seq-based transcriptomic analyses in these models. Through bioinformatic analysis, the goal of this project is to use different tools that may explain resistance to this therapy and tumor relapse. Gene set enrichment analysis, Volcano plots, gene ontology, genetic clustering and comparison between the murine model and human data from different publicly available datasets will be used for this task. The final goal would be to use this information to test novel therapies in combination with SRS to eradicate metastatic nodules in the brain.