



MASTER'S DEGREE IN BIOMEDICAL RESEARCH

Research Project Proposal

Academic year 2023-2024

Project Nº 06

Title: Interpretable deep learning model to predict mutations in lung adenocarcinomas from haematoxylin and eosin-stained (H&E) whole-slide images

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Summary

1. To develop and validate a H&E-based deep learning model for prediction of KRAS-STK11 and KRAS-TP53 co-mutations in lung adenocarcinomas
2. To train, validate and test the model on large-scale and heterogeneous histology datasets, without the need of manual expert annotation
3. To generate interpretable attention heatmaps on the H&E slides to highlight the relative importance of tissue regions for the image classification

Translational study objectives:

1. Weakly supervised deep learning model – to be developed and validated to predict KRAS-STK11 and KRAS-TP53 co-mutations in lung adenocarcinomas.
2. To identify morpho-molecular correlates,
3. The model could be used to refine prognostication and risk stratification of patients

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|-----|---|
| yes | |
| no | X |

Does the project include the possibility of supervised animal manipulation to complete the training for animal manipulator?