BRACCO FELLOWSHIPS
EDUCATION IN RESEARCH
ENROLMENT FORM

Name of Institution / HOSPITAL DE LA SANTA CREU I SANT PAU

City and Country of Institution BARCELONA

RESEARCH GROUP

Brief description of the research group and of its mission:

The pulmonary imaging group is part of the radiology section in Hospital de Sant Pau (a 3rd level university hospital in Barcelona). Its mission is to advance the knowledge of pulmonary imaging and quantitative biomarkers as well as the development of artificial intelligence tools. The main project (national grant) is to develop a quantification model of pulmonary fibrosis and characterize omics parameters in inspiration-expiration lung CT.
We collaborate with the pulmonology and biochemistry department in projects aimed at developing biomarkers for fibrotic pulmonary diseases and creating a comprehensive lung CT biobank.
The aim of the project is to train a fellowship in the research methodology applied to the advanced quantification of pulmonary fibrosis imaging (focusing on inspiration-expiration CT features and pulmonary lesion radiomics).

TITLE OF PROPOSED RESEARCH PROJECT

Development of a Quantification Model of Pulmonary Fibrosis and Characterization of Omics Parameters in Inspiration-Expiration Lung CT

OBJECTIVES

- To understand different pulmonary diseases and their qualitative classifications
- To learn a comprehensive approach to pulmonary imaging techniques (inspiration-expiration CT, high-resolution CT, etc.)
- To learn how to perform advanced quantitative and radiomics analysis of pulmonary imagesTo learn how to code artificial intelligence algorithms to classify pulmonary images

APPLICANT'S DUTIES

- Pulmonary segmentation from inspiration-expiration and high-resolution CT image database
- Correlation analysis between manual and automatic segmentation
- Preparation of problem cases for specific analysis and case presentations
- Classification of pulmonary lesions following the current qualitative classifications according to each disease (fibrosis, emphysema, nodules)
- Database curation (radiological data)

APPLICANT'S BENEFITS

- Participation in scientific outcomes of the project, i.e., presentations at congresses or publications of papers
- A specific one-to-one training in post-processing tools and Python programming is offered to create an image classifier using AI
- Mentoring by a radiologist specialist in pulmonary imaging
- Participation in the committees of pulmonary diseases of the hospital during the stay
- Access to a database of more than 500 patients diagnosed with various pulmonary diseases (fibrosis, emphysema, nodules, etc.), many with inspiration-expiration CT lung

- Project Leader: Josep Munuera
- Members: Ana Giménez, Jose Manuel Brenes, Anton Aubanell, Lydia Canales, Javier Saez