BRACCO FELLOWSHIPS - EDUCATION IN RESEARCH

Project 9:

Use of deep learning to identify growth patterns linked to genetic mutations in colorectal carcinoma

NAME OF INSTITUTION: Netherlands Cancer Institute - Antoni van Leeuwenhoek, Department of Radiology, Amsterdam/THE NETHERLANDS

RESEARCH GROUP AND ITS MISSION:

This project focuses on the association of growth trends with specific clinically-relevant mutations seen in colorectal carcinoma. These growth curves will be generated using automatic (deep learning powered) segmentation algorithms. Significant associations between growth patterns and clinically relevant genetic mutations will be identified. This project will take place within the Immunotherapy Imaging Team of the Department of Radiology at the Netherlands Cancer Institute under the supervision of Prof. Regina Beets-Tan. The NKI is the only Comprehensive Cancer Center in The Netherlands (Amsterdam). It is a well-organized and dynamic cancer research institute accommodating over 50 research groups and advanced core facilities. It is an internationally renowned center covering fundamental, translational and clinical cancer research.

OBJECTIVES:

- Validate the use of automatic segmentation to generate growth curves
- Link growth patterns with specific clinically relevant mutations

APPLICANT'S DUTIES:

- Collect and analyse CT imaging data of the aforementioned cohort in collaboration with the Immunotherapy Imaging Team of Radiology.
- Working within an interdisciplinary team to evaluate the performance of a deep learning powered automatic segmentation algorithm developed in-house and provide feedback/corrections on the automated delineations.
- Analyse growth curves/trends and determine potential associations with clinically relevant genetic mutations.

APPLICANT'S BENEFITS:

- Participation on scientific outcomes of the project i.e. presentations to congresses or publications of papers
- Applicant will receive first-hand exposure to cutting-edge quantitative/radiomic techniques
- Applicant will also receive exposure to artificial intelligence (primarily machine learning and deep learning) in medical contexts
- Applicant will be embedded in the relevant artificial intelligence activities of the department

Project Leader: Prof. Dr. Regina Beets-Tan, MD PhD
Members: Immunotherapy Imaging Team, NKI: Dr. Zuhir Bodalal (Elkarghali), Stefano Trebeschi, Teresa Bucho, PD Dr. Thi Dan Linh Nguyen-Kim