

## RESEARCH TOPIC MEM11 The use of Artificial intelligence for addressing the role of Lipids in the Pathogenesis of Fibrostenotic Crohn's disease Curriculum MEM

Laboratory name Laboratory of Gastrointestinal Immunopathology

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## Abstract

Fibrostenotic Crohn's disease (CD) represents a major clinical complication affecting 11% of Crohn's disease patients at diagnosis. Moreover, 30% of patients presenting with an inflammatory phenotype at diagnosis develop intestinal strictures over a ten years course. Intestinal strictures reduce dramatically the quality of life of patients and may also present clinically in the emergency setting, requiring urgent surgical intervention. Genetic alterations have been found inconsistently associated with strictures development in CD patients. Based on epidemiological evidences, westernization of lifestyle and thus, of dietary patterns, has paralleled an increased incidence and prevalence of CD in the population. Based on these observations, it is coherent to hypothesize that environmental factors may play a crucial role in determining the behavior of Crohn's disease. The impact of dietary nutrients, and in particular, of an high-fat diet has not been extensively studied in Crohn's disease patients. The aim of this project is to develop artificial intelligence algorithms that combines the intake of dietary lipids and high-fat diet frequency with location and behaviour of the disease; response to therapy and tissue biomarkers. This will allow defining an index that may predict the fibrogenic recurrence among the CD patients.

## Main technical approaches

Computational biology and bioinformatics; Mathematical modeling and computational simulations; The use of different programming languages: Python, R, MATLAB, Database, C++.

## Type of contract

PhD scholarship of € 18.000 gross per year awarded by Humanitas University. This sum is exempt from IRPEF income tax according to the provisions of art. 4 of Law no. 476 of 13th August 1984, and is subject to social security contributions according to the provisions of art. 2, section 26 and subsequent sections, of Law no. 335 of 8th August 1995 and subsequent modifications.

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