

HUMANITAS UNIVERSITY

Selection procedure for 1 Research Fellowship in Life Sciences in compliance with art. 22 of Law 240/2010

Humanitas University invites applications for 1 position as Research Fellow in Life Sciences.

Research Program Title	Better control and treatment of immune-mediated diseases by exploring the universe of microenvironment imposed tissue signatures and their correlates in liquid biopsies
Research supervisor - Tutor	Prof. Silvio Danese/dr.ssa Stefania Vetrano
Scientific Area	05 - Biology
Gross amount of the fellowship	28.000 Euro
Duration of the fellowship	12 months
Objectives of the research:	<p>Ulcerative colitis (UC) is a chronic inflammatory disease for which unmet clinical treatment needs exist.</p> <p>An optimal therapeutic approach for these diseases aims to gain rapid control of inflammation and to prevent tissue damage in order to improve patient's quality of life and, if possible, achieve long-term disease remission. Although biologic therapies have provided clinical benefits to patients, these goals are still poorly met, presumably due to the limited knowledge of the underlying mechanisms of immunopathology and the lack of predictive biomarkers that would allow proper patient stratification.</p> <p>ImmUniverse is a highly integrated and transdisciplinary consortium composed of 26 partners that proposes a Multi-Omics analysis to identify profile tissue-specific microenvironments to advance knowledge of pathophysiology of ulcerative colitis and new biomarkers useful for monitoring the disease.</p>

The work place is in Pieve Emanuele/Rozzano - Milano.

A brief description of the project, activities to be carried out, mandatory requirements to take part into the selection process, information on the application procedure and on the selection criteria are presented in the following.

RESEARCH PROJECT:

Ulcerative colitis (UC) is a chronic inflammatory disease for which unmet clinical treatment needs exist.

An optimal therapeutic approach for these diseases aims to gain rapid control of inflammation and to prevent tissue damage in order to improve patient's quality of life and, if possible, achieve long-term disease remission. Although biologic therapies have provided clinical benefits to patients, these goals are still poorly met, presumably due to the limited knowledge of the underlying mechanisms of immunopathology and the lack of predictive biomarkers that would allow proper patient stratification.

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ACTIVITIES TO BE CARRIED OUT:

The Research Fellow will have to deal mainly with the evaluation of evolving technologies such as ultrasound-enabled gut liquid biopsy as non-invasive approach for the identification of new "microinvasive" biomarkers suitable to reflect clinically relevant tissue-based signatures of disease progression and/or response to treatment.

In particular, the Research Fellow will deal with:

- LIPUS- enabled gut liquid biopsy study: to assess the ultrasound-induced bioeffects on the intestinal mucosa, a set of experiments will be first carried out in vitro, order to identify timing, dose, and duration of LIPUS stimulation system on different mucosal cell populations. After stimulation, morphology and functional activities of the cells will be characterized, and supernatants analyzed for cytokines expression, miRNA expression profiling and extracellular vesicles quantification. Primary lamina propria mononuclear cells (LPMC), organoids, endothelial cells and stromal cells isolated from inflamed area of UC patients will be stimulated by LIPUS. After stimulation, morphology and functional activities of the cells will be characterized, and supernatants analyzed for cytokines expression and for Exosome miRNA profiling. This strategy will allow setting up the optimal stimulation conditions able to trigger the desired cell behavior under steady-state and inflammatory conditions;
- Validation of LIPUS technology as a new potential approach to study in vivo intestinal inflammation: LIPUS will be tested in healthy and colitic mice at different phases of colitis using 2 different experimental models of Ulcerative colitis: Dextran Sodium Sulfate (DSS) and oxazolone

induced colitis. After stimulation, blood samples will be analyzed for cytokines expression, miRNA expression profiling and extracellular vesicles quantification.

MANDATORY REQUIREMENTS:

In order to be considered for the post candidates must either be in possession of :

1. “laurea magistrale” awarded in accordance with D.M. 270/2004 or an equivalent university qualification awarded by a foreign university (usually referred to as a Master’s Degree) in one of the subject listed below:
 - Biology
 - Molecular Biology & Biotechnology
 - Veterinary
 - Pharmacy
2. PhD;
3. Scientific and professional CV suitable to the carrying out of the research activities outlined above

SELECTION PROCESS:

Application for admissions must be submitted at the following link:

<https://pica.cineca.it/humanitas>

No hard copy of the application must be sent by post.

At first access, applicants need to register by clicking on “Register” and completing the requested data.

If applicants already have LOGINMIUR credentials, they do not need to register again. They must access with their LOGINMIUR username and password in the relevant field LOGINMIUR.

Applicants must enter all data necessary to produce the application and attach the required documents in PDF format.

SELECTION CRITERIA:

Selection criteria are predetermined by the Selection Committee. As part of the selection process, the Committee will evaluate the curriculum, titles and publications presented by the candidate and will consider, in particular:

- Experience in molecular biology, cellular and preclinical model in the context of chronic intestinal inflammatory diseases
- high and proven experience in FACS, ELISA and WB techniques;
- experience in the isolation of extracellular vesicles;
- a good written and spoken knowledge of the English language

- competence in the field of the bioinformatics in data mining and bioinformatics analysis

FURTHER INFORMATION:

For more details on the selection process please refer to the **Rectorate Decree n. 091/2021** (<http://www.hunimed.eu/it/lavora-con-noi/>) or send an inquiry to ufficiodocenti@hunimed.eu or telephone +39 02.8224.5642/5421.