

## HUMANITAS UNIVERSITY

### Selection procedure for a Type B Research Fellowship in Life Sciences in compliance with art. 22 of law 240/2010

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

|                                |   |
|--------------------------------|---|
| Research Program Title         | Diet, microbiota, intestinal barrier function and cancer: new insight for novel therapeutic approaches  |
| Research supervisor - Tutor    | Dott.ssa Stefania Vetrano   |
| Scientific Area                | 05 – Biological sciences  |
| Gross amount of the fellowship | 21.000 Euro   |
| Duration of the fellowship     | 12 months   |
| Objectives of the research     | Characterization of epithelial barrier function by the expression analysis of junctional molecules; a gene expression analysis on primary intestinal epithelial cells; In vitro screening of dietary derived polyphenols able to modulate epithelial barrier function<br><br>In vivo effects of dietary derived polyphenols in modulating epithelial barrier. |

The work place is in 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:

Colorectal cancer (CRC) is the third most common cancer-related cause of death globally. Only a small fraction of CRC has a familial basis such as in case of hereditary nonpolyposis colorectal cancer or familial adenomatous, whereas the largest fraction of CRC seems to be linked to environmental causes. Emphasis is coming out on the role of the intestinal microbiota and related mechanisms that can drive the chronic

inflammatory process and the initiation of colon cancer development. However the causes leading to the instability of microbial community are not clear, as well as it is still controversial whether these changes represent the causes or the consequences of the tumor development. We hypothesize that the altered intestinal barrier function mediated by dysregulation of tight junctions, not only facilitates the passage of microbial products that drives tumor-elicited inflammation, but also leads to dysbiosis promoting the enhancement of certain bacterial strains with tumor-promoting activity.

This hypothesis will be addressed by following specific aims:

1. Investigation of the functional role of tight junction in modulating gut microbiota
2. Investigation of the functional role of tight junction in modulating gut microbiota in experimental models of colorectal cancer
3. Investigation of the effects of enriched food with known concentration of polyphenols in modulating gut microbiota and intestinal permeability in experimental models of colorectal cancer.

#### **ACTIVITIES TO BE CARRIED OUT:**

The successful candidate will deal with characterization of epithelial barrier function by the expression analysis of junctional molecules; a gene expression analysis on primary intestinal epithelial cells; In vitro screening of dietary derived polyphenols able to modulate epithelial barrier function

In vivo effects of dietary derived polyphenols in modulating epithelial barrier.

#### **MANDATORY REQUIREMENTS:**

In order to be considered for the post candidates must hold a Bachelor's degree obtained in accordance with DM 270/2004 or an equivalent Italian University degree or a comparable academic title granted by a foreign University (usually referred to as a Master's Degree) in Biotechnologies, a Degree in Medicine and Surgery, a Master degree in Biological Sciences or Equivalent, PhD degree, Scientific and professional expertise suitable to carry out the indicated activities.

#### **SELECTION PROCESS:**

The application for admission must be submitted at the following link:

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

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

At the 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.

As part of the selection process, a Selection Committee will evaluate the curriculum, titles and publications presented by the candidate.

**SELECTION CRITERIA:**

The candidate should have a PhD in biological sciences, such as molecular biology, cell biology, or related fields.

Proficient in mammalian cell culture and modern molecular and cell biology protocols; Experience with flow cytometry analysis; Experience in vivo animal models; highly proficient in spoken and written English.

**FURTHER INFORMATION:**

For more details on the selection process please refer to the Rectoral Decree n. 68/2017 (<http://www.hunimed.eu/it/lavora-con-noi/>) or send an inquiry to [ufficiodocenti@hunimed.eu](mailto:ufficiodocenti@hunimed.eu) or telephone +39 02.8224.5642.