Corso di dottorato in Scienze Biomolecolari
PhD in Biomolecular Sciences
Ciclo 41 / Cycle 41
A.Y. 2025-2026

Borse a tematica vincolata / *Reserved scholarships and fellowships*

Borse aggiuntive / Additional places with scholarship

I	Sviluppo di una dieta sana per il microbioma per migliorare l'invecchiamento cognitivo e la salute del cervello / *Development of a microbiome-healthy diet to improve cognitive ageing and brain health* ERA4Health Joint Transnational – NutriBrain "Development of a microbiome-healthy diet to improve cognitive ageing and brain health-MIHEALTHYDIET" CUP E63C24002600006
J	In vivo study of the ribosome-associated quality control and its role in neurodegeneration

UNIVERSITÀ DI TRENTO
Dipartimento di Biologia Cellulare, Computazionale e Integrata - CIBIO
Corso di Dottorato in Scienze Biomolecolari

Scholarship I

Development of a microbiome-healthy diet to improve cognitive ageing and brain health
Sviluppo di una dieta sana per il microbioma per migliorare l'invecchiamento cognitivo e la salute del cervello
Funded by: University of Trento – Department CIBIO Laboratory of Computational Metagenomics (https://www.cibio.unitn.it/147/laboratory-of-computational-metagenomics) ERA4Health Joint Transnational – NutriBrain "Development of a microbiome-healthy diet to improve cognitive ageing and brain health-MIHEALTHYDIET" CUP E63C24002600006
Principal Investigator: Nicola Segata (nicola.segata@unitn.it)
Synthetic description of the activity and expected research outcome The research program is part of the project ERA4Health Joint Transnational – NutriBrain "Development of a microbiome-healthy diet to improve cognitive ageing and brain health-MIHEALTHYDIET" CUP E63C24002600006. The researcher will develop computational methods for the characterization of the human microbiome from metagenomic data. The developed method will need to reach the resolution of single microbial strains and will involve the bacteria, fungal, and viral components of the microbiome. The methods will be applied on metagenomic data from the project datasets with the aims of: i) study how the microbiome-changing diets affect markers of neuroinflammation and brain ageing and ii) decipher targets and pathways of the diet-microbiota-neuroinflammation-brain axis across ageing.
Descrizione sintetica dell'attività e dei risultati attesi Il programma di ricerca fa parte del progetto ERA4Health Joint Transnational – NutriBrain "Development of a microbiome-healthy diet to improve cognitive ageing and brain health-MIHEALTHYDIET" CUP E63C24002600006. Il ricercatore svilupperà metodi computazionali per la caratterizzazione del microbioma umano da dati metagenomici. Il metodo sviluppato dovrà ottenere la risoluzione dei singoli ceppi microbici e coinvolgerà i componenti batterici, fungini e virali del microbioma. I metodi saranno applicati ai dati metagenomici provenienti dai dataset del progetto con gli obiettivi di: i) studiare come le diete che modificano il microbioma influenzano i marcatori di neuroinfiammazione e invecchiamento cerebrale e ii) decifrare i target e i pathway dell'asse dieta-microbiota-neuroinfiammazione-cervello durante l'invecchiamento.
Candidate's profile (skills and competencies) Master of Science degree in Bioinformatics, Computer Science, Computational Biology, Biotechnology, or Microbiology.
Profilo del/la candidato/a Laurea Magistrale in Bioinformatica, Informatica, Biologia Computazionale, Biotecnologia o Microbiologia.

Scholarship J

In vivo study of the ribosome-associated quality control and its role in neurodegeneration
Funded by: EURAC Research - Bolzano
Principal Investigator: Roman Vozdek (roman.vozdek@eurac.edu) & Toma Tebaldi (toma.tebaldi@unitn.it)
Synthetic description of the activity and expected research outcome Ribosome-associated quality control (RQC) represents an essential cellular mechanism responsible for the elimination of incompletely synthesized polypeptides during translation due to ribosome stalling. How point mutations in RQC factors lead to neurodegeneration remains unclear. In this project we will use the C. elegans model organism, whose RQC components are highly evolutionary conserved, and its biological complexity should reveal novel aspects of RQC biology. The selected PhD student will determine the temporal and spatial distribution of RQC components in neurons compared to other tissues and the effect of RQC deficiency on cellular proteostasis and neurodegeneration. In addition, newly generated C. elegans models of RQC activity will be used in genetic screens seeking new regulators of RQC activity. These in vivo studies should elucidate a role of newly identified components of the RQC complex in RQC activity and test our hypothesis of limited RQC activity in neuropils as a cause of neurodegeneration.

Candidate's profile (skills and competencies)

The candidate for this PhD position should meet the following criteria:

• A degree in Molecular Biology, Genetics, Biochemistry, or a related field.

• Preferably hands-on experience with model organisms (e.g., C. elegans) and skills in molecular cloning, PCR, microscopy, and data analysis.

• Responsibilities include designing and executing experiments, analyzing data, conducting literature reviews, and preparing manuscripts.

• Proficiency in English.