

Ph.D. fellow in RNA bioinformatics

IIT invites excellent candidates to apply to its PhD program organized in collaboration with the Open University; this international PhD program confers Doctorates in *Health, Sustainable and Human Technologies*.

In order to be admitted into the ARC program, the minimum requirements are

- i. a Masters-level degree, which broadly corresponds to a 4/5-year undergraduate MSc/MChem/Meng-style degree or to a postgraduate Masters in the British system, or to a second level University degree in Italy;
- ii. a grade corresponding to an upper second class (2.1) or a merit in the UK system or 100/110 in the Italian system. Candidates with lower grades but redeeming features (publications, specific expertise) are requested to contact the potential supervisors before applying;
- iii. where English is not the applicant's first language, a valid IELTS (International English Language Testing System) certificate. The minimum acceptable score is an overall 6.5, with no less than 6.0 in any of the four categories

One PhD fellow positions **will be available from October 1st 2024** in the group of Neurobiology of MIRNA led by Dr. **Davide De Pietri Tonelli**.

Title of the project: Bioinformatics study on small noncoding RNA in brain physiology and pathology.

Background: The project aims at investigating a novel pathway of noncoding RNAs recently identified by our lab in mammalian brain, which plays a role in the maintenance of neural stem cell fitness (Gasperini et al. 2023), and implicated in neurological diseases including neurodegeneration and brain cancers (Sun et al, 2022; Pan et al., 2024).

Description: You will be working in a multicultural group, mainly composed by Life scientists (Biologists, Biotechnologist; biomedical scientists, etc), who work in close collaboration with the multi-disciplinary staff of IIT having strong expertise on -omics, bioinformatics, material science, imaging, neuro-physiology and neuro-electronics. "The neurobiology of miRNA" Research Line is coordinated by Davide De Pietri Tonelli, who has extensive experience in the control of neural stem cell fate by noncoding RNAs in developing and adult mammalian brain. The research focuses on small noncoding RNAs in basic aspects of neurogenesis and its translational applications to RNA-based therapy for brain diseases, using rodents and human cells as models.

The main responsibilities will be to:

- To manage large amount of NGS data and to set up some standardized RNAseq/DNAseq analysis pipelines and software infrastructure required for the team.
- Interact with the Life Scientists in the team to define best strategies to implement semi-automated pipelines for small noncoding RNA analyses
- Identify genomic sources and targets of the small noncoding RNAs in various rodents/human cell models of neurological diseases, including brain cancers.

External References: Gasperini C, Tuntevski K, Beatini S, Pelizzoli R, Lo Van A, Mangoni D, Cossu RM, Pascarella G, Bianchini P, Bielefeld P, Scarpato M, Pons-Espinal M, Sanges R, Diaspro A, Fitzsimons CP, Carninci P, Gustincich S, De Pietri Tonelli D. *Piwi2 (Mili) sustains neurogenesis and prevents cellular senescence in the postnatal hippocampus*. EMBO Rep. 2023 Feb 6;24(2):e53801. doi: 10.15252/embr.202153801. Epub 2022 Dec 6. PMID: 36472244;

Sun YH, Lee B, Li XZ. *The birth of piRNAs: how mammalian piRNAs are produced, originated, and evolved*. Mamm Genome. 2022 Jun;33(2):293-311. doi: 10.1007/s00335-021-09927-8. Epub 2021 Nov 1. PMID: 34724117

Pan X, Dai W, Wang Z, Li S, Sun T, Miao N. *PIWI-Interacting RNAs: A Pivotal Regulator in Neurological Development and Disease*. Genes (Basel). 2024 May 21;15(6):653. doi: 10.3390/genes15060653. PMID: 38927589;

Main Supervisor: [Davide De Pietri Tonelli](#). ([Neurobiology of MIRNA](#))

Essential expertise:

- i. Master in Bioinformatics, computational biology, or a related field
- ii. Documented experience in the bioinformatics field
- iii. Documented experience with the analysis of NGS RNA sequencing data (and related computational tools, ideally in the clinical context).
- iv. Strong knowledge of the main bioinformatics data types and formats and Proficiency in programming (python, R, Linux and Bash etc).
- v. Good communication skills and ability to work in team: the successful candidate will interact extensively with experimental life scientists of the team

Desirable expertise:

- i. Background in (molecular) biology (BSc or certified Experience)
- ii. A good proficiency analysis tools such as Blast; MAFFT CD-HIT; HMMER softwares ABRicate Prokka; E-utilities (Entrez Direct)
- iii. Experience with version control systems and repositories (e.g. Git, GitHub and/or GitLab)
- iv. Ability to work in a challenging and international environment

How to apply. Prospective students must submit using the [online form](#) the following documents

- 1) 2-page CV, which includes studies, expertise and achievements.
- 2) 1-page research statement, which includes the choice of a project from the list above and a justification of the choice. Only if robustly justified, the student may signal their interest also for a second project, but there is no guarantee that this will be taken into account by the selection panel.
- 3) A transcript of undergraduate and postgraduate studies.
- 4) A valid IELTS certificate, obtained no more than two years before the proposed registration date.
- 5) Contact details of two referees.

For this position, ARC accepts candidatures on an ongoing basis (first-come, first-served) .

Istituto Italiano di Tecnologia, with its headquarters in Genoa, Italy, is a non-profit institution with the primary goal of creating and disseminating scientific knowledge and strengthening Italy's technological competitiveness. IIT's research endeavour focuses on high-tech and innovation, representing the forefront of technology with possible application from medicine to industry, computer science, robotics, life sciences and nanobiotechnologies.

Istituto Italiano di Tecnologia is an Equal Opportunity Employer that actively seeks diversity in the workforce.

Please note that the data that you provide will be used exclusively for the purpose of professional profiles' evaluation and selection, and in order to meet the requirements of Istituto Italiano di Tecnologia. Your data will be processed by Istituto Italiano di Tecnologia, based in Genoa, Via Morego 30, acting as Data Controller, in compliance with the rules on protection of personal data, including those related to data security.