DC6: Advancing single-molecule RNA sequencing and structure analysis for custom genomic regions

Host institution: Institute of Bioorganic Chemistry, Polish Academy of Sciences, Poland

Supervisor: Prof. Barbara Uszczynska-Ratajczak

Co-Supervisors: Dr. Rory Johnson, University College Dublin (Academic); Dr. Joao Curado, Flomics Biotech SL (Industrial)

Project description: Recent advances in single molecule sequencing technologies have created new opportunities to study RNA biology in its native context. Yet, conventional RNA sequencing often fails to capture the full diversity of RNA species, especially those with complex structures, low abundance, or extensive alternative splicing. This project seeks to advance native single molecule RNA sequencing by developing an integrated strategy that combines targeted enrichment, adaptive sampling, and structural analysis.These approaches will enable precise single molecule resolution of alternative splicing, RNA folding, and chemical modifications, and will be applied to investigate long noncoding RNAs and to detect cancer biomarkers in liquid biopsy samples. This interdisciplinary project brings together RNA biology, sequencing technology, computational genomics, and bioinformatics. It offers the opportunity to work at the interface of experimental and computational science, with applications in transcriptomics, cancer diagnostics, and RNA therapeutics. The expected outcome is a powerful platform for targeted, high resolution RNA sequencing that will provide comprehensive insight into RNA diversity and accelerate discoveries in molecular medicine. This project is ideally suited to a motivated candidate with an interest in RNA technology development, sequencing innovation, and translational genomics, providing training at the forefront of molecular biology, bioinformatics, and biotechnology.

Host laboratory: The Laboratory of Computational Biology of Noncoding RNA (cobRNA Lab) is a vibrant, multidisciplinary, and international research team dedicated to advancing full length RNA sequencing technologies and exploring the complexity of noncoding RNA biology. Our mission is to develop innovative genomic and bioinformatic approaches for the identification and functional characterization of long noncoding RNAs across vertebrate genomes. The cobRNA Lab currently includes five full time members: one postdoctoral researcher, two PhD students, one technician, and one lab manager. Despite its compact size, the lab fosters a dynamic, collaborative, and supportive environment where ideas flow freely and every member contributes to shaping ongoing research. We take pride in our friendly, open, and inclusive atmosphere, where curiosity and teamwork drive discovery. We are deeply connected to the international scientific community and actively participate in major collaborative initiatives such as GENCODE. Our research impact extends beyond publications, as we regularly organize and contribute to international scientific events, including the recent EMBO Workshop “Non Coding RNA Medicine” (Poznań, 2023). Located in a stimulating academic setting with access to cutting edge technologies and global collaborations, the cobRNA Lab offers an exciting and welcoming environment for scientists passionate about RNA biology, genomics, and computational innovation.

Secondments: This project is carried out in strong collaboration with the following groups, and visits to their laboratories are expected during the project. A willingness to travel and spend time abroad is therefore essential:

- Prof. Rory Johnson, University College Dublin, Ireland;
- Dr. Joao Curado, Flomics Biotech SL, Spain.

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Eligibility conditions:

- Master's degree in Biology, Biotechnology or related fields.
- Applicants must be doctoral candidates, i.e. not already in possession of a doctoral degree.
- Mobility rule: researchers must not have resided or carried out their main activity in the country of the recruiting beneficiary for more than 12 months in the 36 months immediately before their recruitment date.

Required Skills:

- A Master's degree in Biology, Biotechnology, or a related discipline.
- Basic knowledge of RNA sequencing.
- Basic experience with human cell line culture.
- Desirable: familiarity with the Linux command line.
- Desirable: basic understanding of bioinformatics.
- Proficiency in English is essential, including strong oral and written communication skills. Candidates will be asked to provide an English language certificate (for example, IELTS, TOEFL, or Cambridge English). Exemptions apply to nationals of countries where English is the majority native language, or to applicants who have completed a qualification or degree taught and assessed in English. The supervisor may also confirm English proficiency during the interview.

Enquiries

For general information about the INT2ACT Doctoral Network visit the visit the project website (www.int2act.eu) or send an email to int2act@gmail.com.
For additional information on this project please contact prof. Barbara Uszczyńska-Ratajczak (barbara.uszczynska@gmail.com).

How to apply

To learn more about the application process, visit the INT2ACT recruitment web page (https://int2act.eu/open-positions/).

Required documents:

1. Statement of interest (limit of 2,500 characters) explaining why you wish to be considered for the fellowship and which qualities and experience you will bring to the role.
2. Curriculum vitae et studiorum.
3. A certificate of University examinations taken (with marks).
4. A final degree certificate translated in English. If, at the time of application, candidates should not be yet in possession of a degree certificate, they can submit it at the time of the examination.

All documents must be merged into a single PDF file, in the order listed above.
A limited number of applicants will be invited for an interview and will be required to provide contact information of up to two contact person for reference letters.

Application deadline

The closing date for applications is **January 31 2026.**