DC13: RNA interference-based lipid nanoparticles as next-generation therapeutic vehicles for solid tumours treatment

Host institution: Technion Research and Development Foundation, Haifa, Israel

Supervisor: Prof. Avi Schroeder

Co-Supervisors: Prof. Rory Johnson, University College Dublin (Academic); Dr. Jeny Shklover, Technion – Israel Institute of Tehnology (Academic); Roy Nevo, Mana Bio Ltd. (Industrial).

Project description: This project aims to develop RNA interference (RNAi)-based lipid nanoparticles (LNPs) as next-generation therapeutic vehicles for the treatment of solid tumours. A central aspect of the work is the chemical design and optimization of lipid components to ensure efficient RNA encapsulation, stability, and targeted delivery. Particular emphasis will be placed on tailoring lipid composition and incorporating targeting strategies that enable selective uptake by cancer cells while minimizing off-target effects. The formulations will be evaluated for their ability to penetrate tumour tissue and induce therapeutic gene silencing in relevant cancer cell models, followed by in vivo studies to assess biodistribution, tumour accumulation, and overall therapeutic efficacy. The anticipated outcome is the establishment of a robust nanoparticle platform that combines efficient RNA encapsulation, tumour-targeted delivery, and significant therapeutic activity, thereby paving the way for clinical translation of RNAi-based nanomedicines in oncology.

Host laboratory: The Louis Family Laboratory for Targeted Drug Delivery and Personalized Medicine Technologies, led by Prof. Avi Schroeder, aims to improve patients' quality of life and treatment by developing innovative medical technologies. Specifically, we focus on targeted drug delivery systems to treat cancer and brain neurodegenerative diseases. Our nanotechnology is designed according to the loaded drug (proteins, gene delivery, and small molecules) and to the targeted organ. We are a multinational and multidisciplinary team, offering an inspiring research environment that brings together diverse expertise to drive innovation in medical science..

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;
- Roy Nevo, Mana Bio Ltd., Israel.

Eligibility conditions:

- Master's degree in Organic chemistry, Chemical Engineering, Biotechnology, Biochemistry, 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.

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Required Skills:

- Research experience (e.g., through a Master's thesis or research internships) in organic chemistry and biochemical techniques is required. Experience in chemical synthesis and/or nanoparticle formulation will be considered a strong advantage.
- Proficiency in the English language is required, as well as good communication skills, both oral and written. Successful candidates will need to provide an English test (e.g. IELTS, TOEFL, Cambridge English). You may be exempt if you are a national of a majority native-English speaking country, or have qualifications / degree that has been taught and assessed in English. The supervisor can also confirm during the interview that a candidate has the required level of English.

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. Avi Schroeder (avids@technion.ac.il) or Dr. Jeny Shklover (jenysh@technion.ac.il).

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.**