DC14: Development of p53-expressing lipid nanoparticles to target tumour microenvironment (TME) for breast cancer treatment

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

Supervisor: Prof. Avi Schroeder

Co-Supervisors: Dr. Dafne Campigli, Istituto Italiano di Tecnologia (Academic); Dr. Jeny Shklover, Technion – Israel Institute of Technology (Academic); Roy Nevo, Mana Bio Ltd. (Industrial).

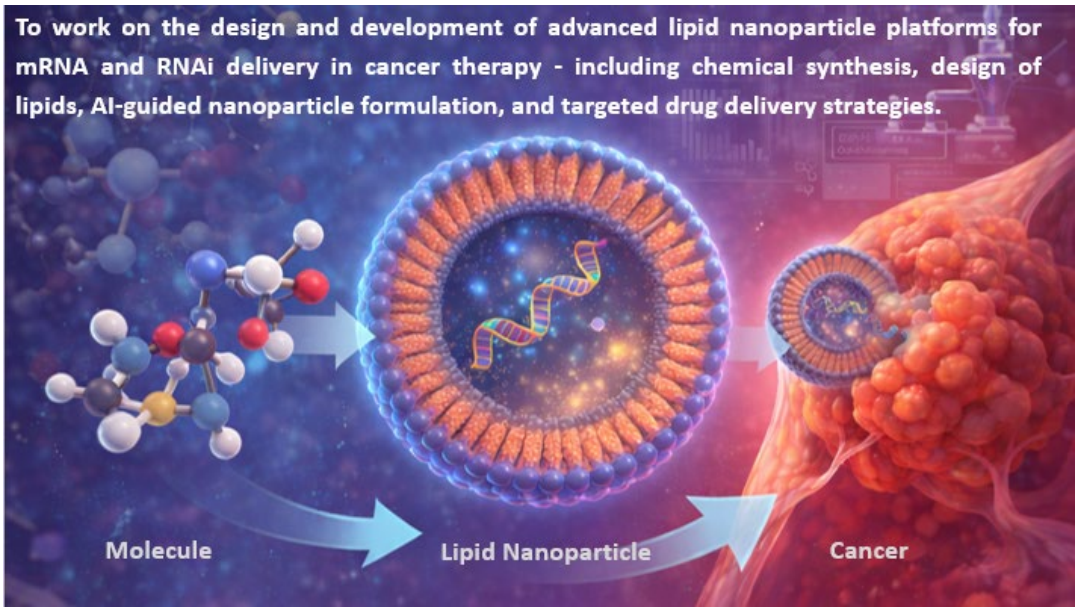
Project description:

We are seeking **Chemists and Chemical Engineers** with expertise and interest in **organic chemistry, lipid synthesis, lipid nanoparticle formulation, RNA delivery, and targeted drug delivery**.

This project focuses on the development of lipid nanoparticles (LNPs) carrying messenger RNA (mRNA)-based therapeutics for targeted delivery to the tumour microenvironment (TME) in breast cancer. The central aim is the **chemical design and optimization of lipid components** to generate LNPs with efficient mRNA encapsulation, stability, and controlled release, while incorporating targeting strategies to ensure selective uptake by triple-negative breast cancer (TNBC) microenvironment cells.

Particular emphasis will be placed on engineering lipid composition and surface modifications that promote efficient delivery to cancer-associated immune cells, with deep assessment of the in vitro, in vivo and therapeutic benefit.

Overall, the project seeks to translate chemical design principles in lipid nanoparticle formulation into effective modulation of the tumour microenvironment, paving the way for next-generation mRNA nanomedicines in cancer therapy.



Host laboratory: The Schroeder Laboratory for Targeted Drug Delivery and Personalized Medicine Technologies (https://www.schroederlab.com/), 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.

Funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency. Neither the European Union nor the granting authority can be held responsible for them.

Funded by the European Union

You can find our publications here: Google Scholar - Avi Schroeder

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:

- Dr. Francesco Nicassio, Istituto Italiano di Tecnologia, Italy;
- Roy Nevo, Mana Bio Ltd., Israel.

Eligibility conditions:

- Master's degree in Organic chemistry, Chemical Engineering, Biotechnology, Biochemistry, or related fields.
- Outstanding candidates holding a BSc degree may be considered for enrolment in Technion's Direct PhD Track program, subject to approval by the faculty and the Graduate School.
- Applicants must be doctoral candidates, i.e., not already in possession of a doctoral degree.

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 project website (www.int2act.eu) or send an email to int2act@gmail.com.
For additional information on this project please contact Prof. Avi Schroeder / Dr. Jeny Shklover (schroeder@technion.ac.il).

How to apply

To apply, please send an email to int2act@gmail.com with all the required documents and the video. Please title the email: "INT2ACT application for DC14, [your first and last name]".

Required application materials:

1. Up to 2-minute personal video explaining your motivation to join the lab.
2. Application form.
3. Curriculum vitae et studiorum.
4. Contact details of up to three referees.
5. A certificate of University examinations taken (with marks).
6. A final degree certificate translated into 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 written documents must be merged into a single PDF file, in the order listed above. Upload the video separately or provide a link.
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

Applications will be reviewed on a rolling basis. The closing date for applications is **July 20, 2026.**