



Obituary

In memoriam: Professor Rimona Margalit (1941–2024)

It is with great sadness that we write this letter in memory of our mentor, colleague and friend Professor Rimona Margalit, who passed away on the 14th of December 2024, at the age of 83, in Tel Aviv, Israel, survived by her two boys, 7 grandchildren and one great-grandchild and many of her mentees worldwide, including leading scientists in academia and industry.

Rimona Margalit was a pioneer physical chemist whose 50-year academic career at Tel Aviv University (TAU) reshaped the world of sustained release drug delivery systems and nanomedicine. After earning a B.Sc. (1966) and M.Sc. from the Hebrew University in physical chemistry and completing her Ph.D. under the mentorship of Prof. Shlomo Schejter (1972) on the thermodynamics of electron transfer in cytochrome *c*, she joined TAU as a young faculty in 1974 in the department of biochemistry and remained active well beyond her official retirement in 2009.

Rimona led breakthroughs in understanding the mechanism of sustained release of ions and small molecules from black lipid membranes (BLMs) and liposomes; she created mathematical models to explain diffusion of ions and small molecules from liposomes based on the modification of Eyring's equations (1). This work was further translated into the understanding of the diffusion of chemotherapeutic drugs from liposomes and opened new avenues in advancing a new generation of chemosensitizers against multidrug resistance pumps in cancer (2,3). Rimona also invented a set of new liposomal vehicles, named bio-adhesive liposomes (BAL), which were coated with bio-adhesive ligands, such as collagen, hyaluronic acid, EGF and gelatine and which became an inspiration to many of us (4–10). These carriers were initially designed for topical and regional drug delivery (4–10). Moreover, the Margalit lab also pioneered a distinct class of long-circulating nano-sized carriers with non-liposomal architecture, enabling deep tissue penetration and efficient intracellular drug delivery. These carriers demonstrated active transport across cellular membranes and were suited for chemotherapeutics, gene delivery, and even neuroactive agents (11–15). Rimona authored seminal papers, including the highest cited paper in the field of cancer nanomedicine in collaboration with Prof. Robert Langer (16). She explored the potential of her findings for most various objectives, including chemical defense against nerve agents (14) using enzyme-encapsulated carriers, diabetes treatment through advanced insulin delivery (15) and gene transfection. Some of Rimona's inventions became translated into novel therapeutic modalities.

In 1997, together with Prof. Josef Kost, Rimona established the Israeli Chapter of the Controlled Release Society (ICRS), where she was active as a scientific advisory member until her last days. The ICRS brings together around 300 members and offers opportunities for basic and translational delivery science to graduate students, postdocs, faculty

and industry. Many of ICRS members were 'offsprings' of Rimona.

Prof. Rimona trained more than 50 M.Sc. and Ph.D. students and dozens of postdocs. As a mentor, Rimona was mathematically sharp, calm under pressure and deeply supportive to us. She fiercely supported us scientifically and emotionally: *"You don't need me looking over your shoulder. This is your mission, and I trust you with it."* She guided us through lab failures while respecting our life challenges, offering quiet maturity and sharp wisdom. She never demanded timecards or imposed strict schedules. Instead of micromanaging or enforcing rules, she instilled a sense of personal ownership over our research. Her ability to select the right people created a lab culture that was intellectually rigorous yet deeply supportive. Many of her students went on to become leaders in academia and the pharmaceutical industry, perhaps the most compelling testament to her mentoring style. Rimona understood our struggles both in and out of the lab, quietly listening and responding with warmth and penetrating advice. We were working on complex problems targeting liposomes to tumors while building families and growing into ourselves. And through all of it, Rimona stood beside us with unwavering trust and dignity. Her modest professionalism shaped our scientific and personal lives. Many of us owe our careers to her unwavering faith during those demanding student years (17–19).

A great scientist, friend, and colleague has passed away. Dear Rimona, thanks for everything that you have done, not only for us, but for all the drug delivery scientists throughout the world. You will always be with us. We will continue the work you began; We will miss you.

Declaration of competing interest

The author declares no conflict of interest.

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Author contributions

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Data availability

Not applicable.

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