TEACHING & LEARNING

Nobel Laureate James E. Rothman and Joy Hirsch Engage NTU Faculty and Students in Deep Scientific Dialogue

James E. Rothman, 2013 Nobel Laureate in Physiology of Medicine and Chair of the Department of Cell Biology at Yale University, whose work on vesicle trafficking has profoundly shaped modern cell biology.

National Taiwan University's Raymond Soong Chair Professorship of Distinguished Research Lecture Series welcomed 2013 Nobel Prize in Physiology or Medicine laureate James E. Rothman on November 5, 2025. Accompanying him was his wife, Prof. Joy Hirsch, a renowned neuroscientist at Yale University, who was invited to deliver the NTU College of Medicine Dean's Lecture. The visit culminated in a joint panel discussion, offering NTU faculty and students alike a rare opportunity to engage with two leading figures at the forefront of biomedical science.

James E. Rothman (right) and his wife, neuroscientist Joy Hirsch (center), engaging in a panel discussion at NTU, sharing insights on science, perseverance, and discovery.

Prof. Rothman was awarded the Nobel Prize for elucidating the molecular mechanisms governing vesicle trafficking within cells—often described as uncovering the principles behind the cell's "logistics system of life." In his keynote lecture, "*Why Is Synaptic Transmission So Fast?*", Rothman vividly illustrated how

synaptic vesicle release operates at speeds thousands to tens of thousands of times faster than other cellular processes, such as cell growth or hormone secretion, earning what he called a “turbocharged” level of performance.

Drawing on decades of pioneering work, Rothman explained how synaptic vesicles achieve this extraordinary speed through a highly symmetric molecular architecture composed of SNARE proteins, chaperone proteins, and calcium-sensing proteins. Using insights from cell-free protein reconstitution systems and cryo-electron microscopy, he described a three-stage energy release mechanism that enables ultrafast neurotransmitter release. He also shared recent findings demonstrating that calcium-sensing proteins function as a molecular “trigger” during the final release phase, supported by evidence from disease-related protein mutations observed in patients with neurological disorders.

During the panel discussion, Prof. Rothman reflected candidly on his scientific journey, emphasizing that a research career in science is inevitably shaped by setbacks and uncertainty. “Only genuine passion allows you to persist,” he observed. When asked how good science is done, he urged young researchers to maintain rigorous self-criticism and to remain open to unexpected results. He introduced his personal motto, “TAGFY—Troubles Are Good For You,” encouraging students to view challenges as essential to scientific development and growth.

Prof. Hirsch complemented these insights by emphasizing that impactful research should challenge prevailing assumptions and change how people think. She highlighted the importance of collaboration, openness, and intellectual confidence—believing in the questions one asks, while recognizing science as an ongoing journey of exploration without a final destination. Both speakers concluded by encouraging students to take responsibility for their own growth, noting that engaged and thoughtful students can, in turn, help their mentors grow as well.

The event sparked lively discussion and left a lasting impression, offering profound inspirations drawn from the speakers’ scientific excellence, intellectual humility, and shared passion for discovery.

NTU President Wen-Chang Chen (left) presenting the Raymond Soong Chair Professorship trophy to Professor James E. Rothman (right) during the campus visit.

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