A *Semblanza* for the RegPep26/2027 Named Prize Lectureship
Professor José Antunes Rodrigues

A life dedicated to science and service (short statement)

There are scientists who publish; there are scientists who teach; and then there are those rare individuals who build entire scientific communities, train generations of leaders, and extend the hand of collaboration across continents and economic divides. Professor José Antunes Rodrigues of the University of São Paulo (USP) at Ribeirão Preto belongs decisively to this third category.

Born on August 18, 1933, in the small town of Santa Rita de Araguaia in the state of Goiás, Brazil, Professor Antunes Rodrigues rose from humble beginnings in the Brazilian heartland to become one of the most influential neuroendocrinologists of his generation, and, more importantly, the architect of Brazilian neuroscience as we know it today. As the International Regulatory Peptide Society (IRPS) prepares to gather in Beijing in 2027, we propose a Named Prize Lectureship that honors not merely his scientific achievements, but his heroic dedication to building bridges between developed and developing scientific communities, his tireless mentorship, and his firm commitment to education as the highest form of scientific legacy.

Professor Antunes Rodrigues has been a long-term supporter and distinguished member of the IRPS. This lectureship is conceived as a tribute to his visionary leadership, his work in under-represented communities worldwide, and his extraordinary life of international collaboration.

Foundational Statement:

1. The Scientist: Pioneering the Neuroendocrine Control of Hydromineral Balance

Before he even completed his medical degree in 1959, young José Antunes Rodrigues had already chosen the path of experimental physiology. Under the mentorship of Professor Miguel Rolando Covian, and indirectly influenced by Bernardo Houssay, the 1947 Nobel Laureate in Physiology or Medicine, he began asking fundamental questions about how the brain controls the body's most basic instincts: thirst and salt appetite.

The breakthrough: discovering the brain's salt appetite control

In 1962, Antunes Rodrigues completed his doctoral thesis on the *Hypothalamic Control of Selective Water and Sodium Chloride Intake*. Just one year later, in 1963, he published a landmark paper in the *American Journal of Physiology* that would forever change our understanding of sodium homeostasis: he was the first to demonstrate the critical importance of the paraventricular (PVN) and supraoptic (SON) nuclei in the specific control of sodium appetite.

This was no small feat. At a time when neuroendocrinology was still in its infancy, Antunes Rodrigues showed that the drive to consume salt, that most primal of cravings, is not

merely a peripheral response to deficiency, but is actively governed by discrete hypothalamic circuitries. He subsequently mapped the complex neural pathways involved, demonstrating that sodium intake control involves not only the hypothalamus but also the olfactory bulb, septal area, subfornical organ, and amygdaloid complex.

The atrial natriuretic peptide (anp) revolution

When atrial natriuretic peptide (ANP) was discovered as a cardiac hormone regulating blood volume and sodium excretion, Antunes Rodrigues made a series of prescient observations. He identified ANP receptors in hypothalamic neurons, in regions precisely associated with sodium intake and excretion control. This suggested that the heart and the brain were engaged in a continuous, bidirectional dialogue about the body's fluid status.

His subsequent work, published in the *Proceedings of the National Academy of Sciences* (1985-1992), demonstrated that osmotic, adrenergic, cholinergic, and peptidergic stimulation of the hypothalamus induces ANP release, and that direct administration of ANP into specific brain regions inhibits both water and sodium intake. Even more remarkably, he showed that ANP release induced by extracellular volume expansion is blocked when specific hypothalamic-pituitary neural pathways are destroyed, proving that the central nervous system is not a passive recipient of peripheral signals but an active, essential participant in the regulation of blood volume and sodium balance.

A 2025 retrospective review in the *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology (which?)* explicitly frames his work as a legacy noting that his classical experiments using lesions, drug microinfusions, and behavioral analysis were "crucial to elucidate several aspects of the regulation of hydromineral balance". Fifty years after his pioneering research, immunohistochemistry and modern molecular tools continue to build upon the foundations he laid.

Scientific output and recognition

Professor Antunes Rodrigues has published approximately 370 scientific articles in indexed journals, 35 book chapters, and has been cited over 7,500 times, with an H-index of 42 . His scholarly output is matched by the prestigious recognitions he has received:

- National Order of Scientific Merit – Commander (Presidency of the Republic of Brazil, 1998)
- National Order of Scientific Merit – Grand Cross (2005)
- Professor Emeritus, FMRP-USP (2005)
- Professor Honoris Causa, Federal University of Rio de Janeiro (2013)
- Member, Brazilian Academy of Sciences (1994)
- Honorary Member, São Paulo Academy of Medicine (1994)
- Professor Emeritus Prize, Brazilian Society of Endocrinology and Metabolism (2019)

2. The mentor: building a nation's neuroscience workforce

If Professor Antunes Rodrigues's scientific discoveries constitute his first legacy, his second, and perhaps even greater, legacy lies in the hundreds of scientists he has trained. The numbers are staggering:

- ~50 Doctoral theses supervised
- 22 Master's dissertations supervised

- 10 Postdoctoral fellows supervised
- 17 Medical school graduating classes at FMRP-USP have honored him as their Professor Homenageado, a rare distinction reflecting deep student affection

But numbers alone cannot capture the impact. His former students now hold faculty positions in physiology and clinical endocrinology across dozens of Brazilian states and in several countries abroad. More than 50 Principal Investigators in Brazil alone trace their academic lineage directly to his laboratory .

What kind of mentor inspires such loyalty and productivity? Those who studied under him describe a leader who combined rigorous scientific standards with genuine personal investment in each student's success. As one former doctoral student noted in a recent tribute, his laboratory was not merely a place of experimentation but a school of character, where young scientists learned that integrity, curiosity, and hard work were non-negotiable prerequisites for entering the scientific profession .

He built the graduate program in physiology at FMRP-USP into one of the most respected in Latin America, serving as course coordinator (1977-1980), postgraduate commission president (1978-1982), department chair (1982-1989), vice-director (1989-1993), and finally director of the entire medical school (1993-1997). In each administrative role, he fought for resources, for autonomy, and for the principle that Brazilian science could, and should, compete at the highest international levels.

3. The internationalist: building bridges across continents

Perhaps no aspect of Professor Antunes Rodrigues's career is more relevant to the RegPep26/2027 Beijing meeting than his lifelong commitment to international scientific collaboration, particularly between developed nations and under-represented scientific communities.

The McCann connection

After completing his doctorate, Antunes Rodrigues spent two years (1964-1966) at the University of Pennsylvania as a Rockefeller Foundation Fellow, working under Dr. Samuel M. McCann, one of the pioneers of neuroendocrinology . He then moved to the University of Texas Southwestern Medical Center in Dallas (1966-1968), again under McCann's mentorship, where he elaborated his monographs on the neuroendocrine control of hydromineral balance .

These formative years in the United States were not merely about acquiring techniques. Antunes Rodrigues built lasting relationships with the global neuroendocrine community, relationships he would later leverage to bring Brazilian students, collaborators, and recognition into the international mainstream. He understood early on that **science knows no borders**, and that the isolation of developing-country researchers **was a barrier to be actively dismantled.**

Regular Organizer of International Conferences

Throughout his career, Professor Antunes Rodrigues has been a tireless organizer of international scientific meetings at the School of Medicine of Ribeirão Preto. He has transformed this institution into a hub for global exchange, regularly hosting visiting scholars from North America, Europe, and Asia. These conferences have provided Brazilian students with exposure to world-class research without the prohibitive costs of international travel, democratizing access to cutting-edge science .

His research grants from FAPESP (São Paulo Research Foundation) have consistently included international collaboration components, bringing foreign researchers to Brazil and sending Brazilian students abroad for training. He has served on the editorial boards of *Molecular Psychiatry* (1990-1996) and the *Brazilian Journal of Medical and Biological Research* (2006-present), using these positions to advocate for the inclusion of high-quality research from developing countries .

A Visionary for Under-Represented Communities

In a scientific world where resources, recognition, and publishing opportunities remain heavily concentrated in wealthy nations, Professor Antunes Rodrigues has been a **consistent voice for equity**. He has mentored scientists from across Latin America, welcomed collaborators from Africa and Asia, and insisted that scientific excellence is not the exclusive property of any single region.

His "heroic life and effort for international collaboration and education", as the RegPep26 organizing committee has rightly characterized it—reflects a deeply held conviction that **science advances fastest when all minds, regardless of geography, are brought to the table**. This is not merely a strategic position but a moral one, rooted in the same humanistic values that have guided his entire career.

4. The human being: humility, generosity, and perseverance

Behind the publications, the prizes, and the titles lies a man of extraordinary personal qualities. Those who know Professor Antunes Rodrigues speak of his **gentleness**, his **generosity with time**, and his **complete absence of pretension**, remarkable traits for a scientist of his stature.

A teacher above all

Despite serving as director of one of Brazil's most prestigious medical schools, despite receiving Brazil's highest scientific honors, Professor Antunes Rodrigues has never stopped teaching. For 17 different graduating classes, he was chosen as the honoree professor, a distinction voted by students themselves, reflecting his accessibility, his kindness, and his genuine passion for educating young minds .

Even in his 80s and 90s, he remained active in research and mentoring, attending lab meetings, reviewing manuscripts, and offering guidance to the next generation. He has often said that his greatest pride is not his own publications but the success of his students, a sentiment that defines the true mentor.

The fight for Brazilian science

Brazilian science has faced chronic underfunding, political headwinds, and institutional instability. Throughout these challenges, Antunes Rodrigues has been a **steadfast advocate** for sustained investment in research and education. He has served as advisor to CNPq (National Council for Scientific and Technological Development) and CAPES (Coordinating Body for Advanced Training of Higher Education Personnel), using these positions to fight for grants, for positions, and for recognition of Brazilian science on the world stage .

His perseverance in the face of adversity, what Brazilians call *garra*, has inspired generations. He built a world-class research program not in Boston, London, or Tokyo, but in

Ribeirão Preto, a city in the interior of São Paulo state. He proved that excellence is not a function of geography but of vision, hard work, and an unwavering belief in one's mission.

5. The lectureship: a fitting tribute

The proposed **Professor José Antunes Rodrigues Named Prize Lectureship** at RegPep26/2027 in Beijing would serve multiple noble purposes:

Honoring a visionary

First, it would recognize a scientist whose contributions to neuroendocrinology, particularly the central control of hydromineral balance and ANP physiology, are of the highest order. His work has fundamentally shaped our understanding of how the brain and body collaborate to maintain fluid and electrolyte homeostasis.

Celebrating mentorship

Second, it would celebrate the **principle of mentorship** as essential to scientific progress. In an era of hyper-competition and individual career metrics, this lectureship would send a powerful message: that training the next generation is not a secondary activity but a primary scientific achievement. The fact that more than 50 PIs in Brazil alone trace their lineage to his laboratory is a testament to his enduring impact.

Advancing international collaboration

Third, and most centrally, the lectureship would **spotlight the importance of international scientific collaboration**, particularly between well-resourced and under-resourced scientific communities. Professor Antunes Rodrigues has spent a lifetime building these bridges. By naming a lectureship in his honor, the IRPS would signal that such bridge-building is not peripheral to the society's mission but central to it.

Inspiring the next generation

Finally, the lectureship would serve as an **inspiration** to young scientists from developing countries who wonder whether they, too, can achieve global recognition while staying rooted in their home communities. Professor Antunes Rodrigues's example proves that the answer is an emphatic yes.

Professor Antunes Rodrigues once said, through the example of his long, productive, and generous life, that science is not a competition but a conversation across generations and across borders. The RegPep26 Professor José Antunes Rodrigues Named Prize Lectureship will ensure that this conversation continues, that his voice remains present, and that his legacy inspires regulatory peptide scientists for decades to come.