

Nino Salvatore's contribution to scientific collaboration between Europe and the US in endocrinology

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On the 7th and 8th September, 2007, an international meeting commemorating the 10th anniversary of the death of a remarkable endocrine scientist, scholar and teacher took place in Naples, Italy. Gaetano ("Nino") Salvatore was born in Naples, where his career was focused, but his influence was worldwide. Former colleagues from the US, UK, Belgium, France and Japan joined the many Italian scientists and students who gathered in the Aula Magna "Gaetano Salvatore" of the University of Naples Federico II to celebrate his achievements. The meeting title was "Thyroid and Beyond" to stress his multifaceted scientific interests.

Nino's passion for endocrinology and the thyroid gland began in Paris in the late 1950s under Jean Roche and continued at the "Stazione Zoologica" in Naples where Nino later became President. Nino and his collaborators demonstrated the presence of thyroid hormones in chordates and in cyclostomata, and a thyroglobulin-like protein in lamprey. While in Paris, Nino met Edward Rall and began a lifelong connection with the NIH. In the 1960s, when in Ed Rall's and Jacob Robbins' laboratory at the NIH Clinical Endocrinology Branch, he studied the structure and biosynthesis of thyroglobulin; his last, posthumously published, paper (Gentile F *et al.* [1997] *J Biol Chem* 272: 639–646) described the synthesis of T₃ and T₄ within this protein.

Nino had a clear vision in organizing science. He encouraged young investigators to work abroad, mainly at the NIH, but elsewhere too. These exchanges brought expertise to the new Institute of General Pathology led by Nino at the University of Naples Federico II. In the 1980s, while head of this institute and of the Italian National Research Council Center for Experimental Endocrinology and Oncology—which now bears his name—he encouraged the selection of a common biological system

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(the thyroid) on which the diverse experiences acquired by his collaborators could converge.

Nino encouraged links between cellular and molecular biology, producing important advances in both technology and ideas. His group devised the FRT-L-5 system of rat thyroid cells that carry out *in vitro* all the differentiated functions of the thyroid gland; this system is now used worldwide. The diverse approaches he encouraged were instrumental in the discovery of rearrangements in the *RET* proto-oncogene in papillary thyroid cancer and in elucidating the role of genes encoding transcription factors—*NKX2-1* (NK2 homeobox 1), *FOXE1* (forkhead box E1) and *PAX8* (paired box 8)—in early development of the thyroid gland and in congenital thyroid dysfunction. Both discoveries, derived from basic research, have proved important in clinical endocrinology.

Nino understood the importance of clinical endocrinology and was a major proponent of a law in Italy that introduced consumption of iodized salt to counteract endemic goiter, and for screening the newborn for congenital hypothyroidism. He was also very influential in restructuring the medical curriculum in Italy. In the last 2 years of his life, as described by Howard Schachman at the international meeting, Nino was an important spokesman in Italy and across Europe on all types of science policy—funding for basic science, ethical practices, and support for unfettered research on cloning while still expressing concern about its application. As Ed Rall said, he was ever accessible to students; they knew he would always listen to them and give them impeccable advice. Indeed, he brought to every endeavor limitless energy, exciting enthusiasm, deep insight, broad knowledge, toughness and compassion, and deeply held convictions about the importance of science and the absolute necessity for international cooperation.

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Competing interests

The authors declared no competing interests.

www.nature.com/clinicalpractice
doi:10.1038/ncpendmet0680