Clinical History of the Theranostic Radionuclide Approach to Neuroendocrine Tumors and Other Types of Cancer: Historical Review Based on an Interview of Eric P. Krenning by Rachel Levine

Rachel Levine[1] and Eric P. Krenning[2]

[1]Corporate Communications, Advanced Accelerator Applications, S.A., New York, New York; and [2]Erasmus University Medical Center (Erasmus MC), Rotterdam, The Netherlands

In nuclear medicine, the term *theranostics* describes the combination of therapy and diagnostic imaging. In practice, this concept dates back more than 50 years; however, among the most successful examples of theranostics are peptide receptor scintigraphy and peptide receptor radionuclide therapy of neuroendocrine tumors. The development of these modalities through the radiolabeling of somatostatin analogs with various radionuclides has led to a revolution in patient management and established a foundation for expansion of the theranostic principle into other oncology indications. This article provides a review of the evolution and development of the theranostic radionuclide approach to the management of neuroendocrine tumors, as described by the inventor of this technique, Eric P. Krenning, in an interview with Rachel Levine.

Key Words: PRRT; neuroendocrine; somatostatin; PSMA; peptide

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mainly neuroendocrine tumors (NETs) (*4,5*) in the late 1980s and early 1990s, although these acronyms were not published until 1994 (*5*).

The origination of PRS and PRRT date back to an endocrinology postdoctoral meeting of Erasmus University Medical Center (Erasmus MC), Rotterdam, The Netherlands, in 1985. Steven Lamberts presented slides with receptor autoradiograms obtained and originating from Jean Claude Reubi, who was, at that time, working at the Sandoz Research Institute in Basel, Switzerland. Using slices of tumor tissue obtained from patients with gastroenteropancreatic NETs (GEP-NETs), Reubi, Lamberts, and collaborator Larry Kvols (at the Mayo Clinic, Rochester, Minnesota, at that time) had demonstrated, for the first time, the presence of receptors for somatostatin on the surface of intestinal NET cells. This finding was crucial to identifying (one of) the mechanisms of action of octreotide, a somatostatin analog invented at the Sandoz Research Institute and first published in 1982 (*6,7*). Reubi's team was using