

Mauricio Rocha e Silva

1910–1983

Mauricio Rocha e Silva, the discoverer of bradykinin, died last December in São Paulo at the age of 73. He had recently retired from his Chair of Pharmacology at the Medical School of Ribeirão Preto of the University of São Paulo where, working with enthusiasm and tenacity, he had constructed one of the most productive biological departments in Brazil and Latin America.

Professor Rocha e Silva was born in Rio de Janeiro and grew up in the stimulating atmosphere of the flourishing old Brazilian capital. While a medical student he made some incursions into literature, writing novels and even starting to write a play for the theatre. Soon after graduating in medicine in 1933 he considered becoming a physicist but instead moved to São Paulo to start his successful pharmacological career. His love for theoretical physics, however, endured throughout his life as shown by some of his last papers on hydrogen lines spectrum, electrostatic fields and Rydberg constant.

He began his scientific training with Dreyfus in the University of São Paulo, Thales Martines in the Butantã Institute and then with Oto Bier at the Biological Institute where he later became Head of the Biochemistry and Pharmacodynamics Section. For the next fourteen years his work was mainly relating to the pharmacology and physiopathology of histamine and proteolytic enzymes. During this period he collaborated with renowned scientists such as Dragstedt at the North Western Medical School (1938–40), Code in Rochester (1941), Bergman at the Rockefeller Institute (1942), Jaques at the University of Toronto (1946), and Rimington and Schild at University College, London (1947).

During his stay in London his contact with many of Dale's disciples taught him the power of bioassay with isolated preparations, especially as a tool for research in developing countries. He would always stimulate students and young pharmacologists to become aware of its simplicity, low cost and wide applicability, and it was with bioassay that serendipity helped him to discover bradykinin. Professor Beraldo went to Rocha e Silva's laboratories at the Biological Institute of São Paulo to learn histamine bioassay. Dr Rosenfeld, from the Butantã Institute was interested in studying cardiovascular shock produced by the venom of a Brazilian snake called *Bothrops Jararaca*. They injected the venom intravenously in dogs to see whether it would release histamine, since Feldberg & Kellaway (1938) had earlier described the release of histamine by venoms of Australian and Indian snakes. After the Jararaca venom administration, samples of venous blood immediately tested were devoid of any contracting activity upon the the guinea-pig ileum. Intriguingly enough, after the blood was allowed to stand on the bench for a few minutes, it produced a strong contraction of the isolated preparation. These contractions were not inhibited by antagonists of histamine or acetylcholine. The venom was then tested in livers perfused with blood. The same type of guinea-pig contracting substance was found but unexpectedly, the venom also produced activity when injected into the effluent blood. Thus, it was the simple incubation of the venom with blood that generated the new gut contracting activity. Because the rate of contraction was slow compared with that induced by histamine or acetylcholine, the new principle was baptized brady (slow) kinin (movement). In the original paper Rocha e Silva, Beraldo & Rosenfeld (1948) also demonstrated that similar contractile activity could be generated by incubating pseudoglobulin of the plasma with venom or trypsin and the bradykinin formed contracted other isolated preparations and was hypotensive when injected into the dog, rabbit or cat. Although the hypotensive effects of a tissue principle named kallikrein had previously been described by Werle in Germany, It was Rocha e Silva's clear-cut demonstration of bradykinin that was the foundation stone in the development of the knowledge of the new kinin system.

When I finished medical school I went to work with Professor Rocha e Silva in the new Medical School at Ribeirão Preto in the Pharmacology Department of which he had been Chairman since 1957. It was 1961 and the recent determination of the structure and synthesis of bradykinin by the Sandoz scientists created an atmosphere of success which was extremely stimulating. I had intended to work in psychopharmacology but after a few months I was happily searching for substances which inhibited bradykinin inactivation by plasma. This work culminated in the discovery of the bradykinin potentiating peptides (BPP) extracted from the venom of *B. Jararaca*. When I showed the results of BPP to Professor Rocha e Silva he said I was too young to discover something new in a subject they had been working on for so many years. But he opened his desk drawer, gave me a pot containing a few grams of the precious Jararaca venom, and smiling, he said, "I hope this will help you to convince

me". It was with this material that we did the first experiments which paved the way for the discovery of captopril by the Squibb scientists (1970–1). I believe that BPF could only be discovered in a laboratory that had expertise in bioassay, kinins and venoms and I was lucky to be there.

Those who performed experiments on Sundays would always find professor Rocha e Silva immersed in his work. He would dedicate some of his calm Sunday mornings to the philosophy of science and it was probably then that he wrote many of his essays such as 'The logic of the invention', 'The evolution of scientific thought' and 'The Cartesian myth'.

Professor Rocha e Silva was a man of slow movements, who had difficulty in projecting his voice but was a superb writer, endowed with extremely acute logic. Although he enjoyed solitude he was very gregarious and his students and associates were frequently invited to his house where they could appreciate his passion for Wagner and Shakespeare. He was not a successful politician in the university, probably because of his declared distaste for the mediocracy in our university establishment, especially following the military coup of 1964.

More than thirty years ago, he was amongst the founders of the Brazilian Society for Advancement of Science, which is still today the forum for defence of scientist's rights and the development of Brazilian science. The success of this society can be appreciated by its annual congress which gathers about five or six thousand associates from all branches of science and culture. All Brazilian scientists are indebted to this man who lived all his life in a country stirred by enormous contradictions and fought tirelessly for the development of science which he considered to be of fundamental importance for breaking the cycle of underdevelopment.

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