



# Paula Pitha-Rowe

## 1937–2015

Katherine A Fitzgerald

Paula Pitha-Rowe, Professor of Oncology, Molecular Biology and Genetics at the Johns Hopkins University Department of Biology and the School of Medicine, passed away 5 March 2015 in Baltimore, Maryland. Paula was an internationally renowned scientist whose pioneering research helped define the biology of interferon. Paula embodied the spirit of what a great scientist should be: inquisitive, fearless, creative, open and generous. She will be deeply missed by colleagues in Baltimore and elsewhere around the world.

Paula was born in Prague, Czechoslovakia (now the Czech Republic). She received her doctoral degree in 1964 from the Czechoslovak Academy of Sciences. In 1965, she began a postdoctoral fellowship at the National Research Council in Ottawa, Canada, where her work focused on the biophysical properties of nucleic acids. During that time, Paula also frequented Paris on a European Molecular Biology Organization fellowship at the Institut Curie working on the physicochemical properties of polynucleotides. It was in Paris where Paula's interest in interferon took hold. Following the discovery of interferon, the ability of double-stranded RNA to elicit type I interferons was appreciated. Given her expertise in polynucleotides, Paula was intrigued by the finding that simple double-stranded polynucleotides such as poly(I:C) could induce interferon in cell culture. After some time at the Salk Institute for Biological Studies in San Diego, California, Paula moved to the Johns Hopkins Cancer Center.

Initially, she was eager to find more effective interferon-inducing polynucleotides. She established her own laboratory at Johns Hopkins University in 1971. A major breakthrough at the time involved her laboratory's development of a mechanism to detect the interferon-encoding RNA itself. The ability to detect mRNA encoding a biologically active protein allowed the cloning of not only interferon but also other cytokine-encoding genes.

Molecular biology was laborious, but Paula's laboratory cloned cDNA from induced cells and identified interferon-encoding cDNA by its ability to hybridize to interferon-encoding mRNA. The cloning of interferon-encoding genes was like the opening of Pandora's box. Not only could interferon now be produced by recombinant technologies in sufficient amounts for clinical use but also, unexpectedly, instead of a single interferon-encoding gene, it was discovered that a whole family of genes encoding interferon- $\alpha$  (IFN- $\alpha$ ) exist. Many in the field were intrigued by the finding that there were so many genes encoding IFN- $\alpha$  and wondered if the functions of their products differed. What followed was a sustained period of important discoveries. Paula's laboratory cloned and characterized mouse genes encoding IFN- $\alpha$  and defined their chromosomal location. They went on to show that the expression of individual interferon-encoding genes was determined by the cell phenotype and was transcriptionally regulated. From there, the goal was to define the molecular mechanisms involved in the virus-induced expression of these genes.

Katherine A. Fitzgerald is in the Program in Innate Immunity, University of Massachusetts Medical School, Worcester, Massachusetts, USA.  
e-mail: [kate.fitzgerald@umassmed.edu](mailto:kate.fitzgerald@umassmed.edu)

They identified upstream regulatory elements in the mouse gene encoding IFN- $\alpha 4$  that conferred inducibility and cell type-restricted expression. These discoveries eventually paved the way for the purification of interferon-regulatory factor 3 (IRF3), a key transcription factor that binds to the interferon-stimulated response element and activates the expression of interferon-induced genes. Her laboratory went on to define the regulation of IRF3 and the later the importance of the related factors IRF5 and IRF7. Paula's laboratory also identified viral antagonists of the interferon system with the discoveries of herpesvirus 8-encoded IRFs. Paula also made major contributions to understanding of the role of interferons in retroviral infection. In collaboration with her husband, Wallace Rowe, these endeavors focused on murine retroviruses and, later, human immunodeficiency virus.

In addition to her scholarly and professional contributions, by far Paula's greatest accomplishments were what she gave back to those lucky enough to have known her professionally and personally. Paula was incredibly warm, compassionate and kind. She trained numerous students, postdoctoral fellows and research fellows, many of whom continue to make substantial contributions to science today. Paula had a unique way of motivating those in her laboratory, recalls Betsy Barnes, a former postdoctoral fellow who now runs her own laboratory. On any given day, Paula would come into the laboratory and ask "What's new?" Laboratory members never knew if she meant this personally or scientifically, but either way, it was her method of staying connected to the people and to their research. Everyone always felt that she was interested in the person and the work. This generosity extended well beyond her own group; I benefitted enormously from her mentorship, guidance and friendship. My own work on interferon was inspired by a meeting I had with her when she visited the University of Massachusetts in 2001. We quickly became colleagues and friends. I credit my own success to that meeting and owe her for all that she has done for me ever since.

Paula was a fantastic role model for women in science, long before this was fashionable. She rose through the academic ranks at a time when few women did. Incredibly she did all of this while raising two children by herself, following the death of her husband. She made it look easy and inspired many young women to think and do the same.

During her career, Paula was a long-time supporter of and participant in the International Cytokine and Interferon Society. Almost always a plenary speaker at the annual meeting, she was not only a recipient of the Milstein Award but was also made an honorary member due to her long-time service to the society. Her willingness to serve her colleagues was an example of her unselfish generosity that was a hallmark of her long career.

Beyond science, Paula had a very broad interest in culture and a great appreciation for the arts. Her adventurous spirit allowed her to combine her love of science and travel. She had friends all over the world. She was enjoying her retirement doting on her two grandchildren. Her death came all too soon. She will be missed by all who knew her.