

Tricia Cohen, co-founding principal investigator of the MRC Protein Phosphorylation Unit (3 May 1944 – 4 August 2020)



After graduating with a BSc in biochemistry from University College London (UCL) in 1966, Tricia obtained her PhD in physical anthropology in 1969. Tricia then spent 2 years carrying out postdoctoral research at the University of Washington, Seattle, before beginning her independent research career in the embryonic Biochemistry Department at the University of Dundee in October 1971, initially supported by a 1-year postdoctoral fellowship from the UK Government, awarded to British scientists returning from North America. She was employed by the University of Dundee from 1973 to 1990 on a part-time contract, renewed annually, since she wanted to spend time with her children when they were young (Suzanne born in 1974, Simon born in 1977). She worked mornings until they were five, then primary school and later high school hours, but frequently returned to the lab in the evening once the children were asleep.

A key turning point in Tricia's career came in 1981, on the Greek Island of Spetses, where I was lecturing at a summer school. Tricia spent the week with the children on the beach and didn't go to a single lecture, yet always recalled it as the most important conference of her life. Over dinner each evening, she talked for hours about the emerging technique of gene cloning with Donna, a scientist attending the conference, whom she never met again. These discussions inspired Tricia to retrain as a molecular biologist when she returned to Dundee, initially by reading *Molecular Cloning: A Laboratory Manual* written by Tom Maniatis. Compared to today, the methods used were primitive; her first success was to clone and sequence phosphorylase kinase, one of the first protein kinases to be cloned.

Tricia then decided to take a crack at cloning the catalytic subunits of protein phosphatase (PP1) and PP2A. Using peptide sequences from a few tryptic peptides that had been determined, Tricia succeeded in determining the complete amino acid sequences of both proteins by gene cloning. In those days, one had to read the sequencing gels by eye and translate the DNA sequence to the protein manually, which Tricia began on a boat between Naples and the island of Ischia in 1987, en route to a conference. I recall the huge excitement when Tricia saw for the first time that PP1 and PP2A were structurally related and therefore members of the same gene family.

Tricia went on to identify many other members of what became known as the PPP family of protein phosphatases and made major advances in identifying

the physiological roles of PP4 and PP5 and how they were regulated. She discovered a related gene encoded in the genome of bacteriophage λ , which I showed was catalytically active. Today, the phage λ phosphatase is used routinely to remove phosphate from proteins. Tricia also cloned and sequenced the isoforms of PP2C, the prototypic members of the PPM subfamily of protein phosphatases.

Tricia's ability to clone and express large amounts of these phosphatases led to a collaboration with the crystallographer David Barford, which was initiated when David spent a year in Tricia's lab in 1990. David went on to determine the 3D structures of PP1 and PP2C, and the TPR domains of PP5, the first crystal structure of a TPR domain. Tricia also cloned and characterized many of the regulatory and targeting subunits of PP1, identifying how, for example, the hepatic, glycogen-associated form of PP1 is regulated by insulin and by the level of glucose in the blood.

Tricia published over 120 papers on protein phosphatases between 1987 and 2015, a period in which 34 postdoctoral researchers and 17 PhD students were trained in her lab.

In 1990, the Medical Research Council decided to establish a Protein Phosphorylation Unit at Dundee under my direction, with Tricia as its Head of Molecular Biology. Tricia became an employee of the Medical Research Council, the first full-time, pensionable salary she had ever received! To mark her achievements, Tricia was awarded an honorary professorship by the University of Dundee in 2001.

Tricia was an exceptionally talented experimentalist who loved working at the bench and was able to perfect and exploit very difficult-to-use techniques. She worked ferociously 'to catch up for lost time', and continued to do experiments herself until 2 years ago. Yogesh Kulathu recalls: "My first memories of Tricia are from the time I started as a Principal Investigator at the Unit (7 years ago) and would be doing experiments late in the evening and would almost always find Tricia in a lab coat also at the bench."

An extended version of this obituary can be found online.

The University of Dundee has set up the Tricia Cohen Memorial Fund: <https://uod.ac.uk/tricia-cohen>

Philip Cohen (University of Dundee, UK)