Obituary: Professor Christopher Stanislaus Potten BSc, PhD, DSc 1940 – 2012

Professor Chris Potten passed away on the 3rd of August 2012, of cancer of the pancreas, from which he had been suffering for some time; he will be sadly missed. He was a pioneer of epithelial and stem cell biology and had been Editor-in-Chief of *Cell Proliferation* from 1991 - 2003, for which we all owe him a debt of gratitude, and Editor of its predecessor *Cell and Tissue Kinetics*, from 1988 - 1991.

Chris was born in Calcutta in 1940. His undergraduate life was passed at Queen Mary, University London, where he obtained his BSc in Zoology and Botany in 1962. Next, at Guy's Hospital in London he undertook and achieved his MSc in Radiation Biology and Physics, followed up at UCL, by his PhD in Radiobiology. Ultimately Chris was awarded his DSc by the University of Manchester, but after his PhD he undertook postdoctoral fellowships in the United States, first in the Department of Biology at Brown University Providence, Rhode Island, then in the Department of Cell and Radiation Biology, Allegheny General Hospital, Pittsburgh. On returning to the UK he joined the Paterson Institute for Cancer Research in Manchester, UK, where he passed thirty-seven years, rising to become Head of Epithelial Biology (for 30 of them), Associate Director of Research, and Cancer Research Campaign (now Cancer Research UK) Life Fellow. Amongst many accolades Chris also held the International Marie Curie and Weiss medals for services to radiation research. Later, Chris set up and became Chairman and Scientific Director of Epistem Ltd, a company dedicated to promoting practical clinical and therapeutic applications of his research, and widely providing a testing service to the pharmaceutical industry. The venture was very successful.

As a research worker and thinker Chris was indefatigable, developing wide-ranging, original and profound concepts in his field of investigation, yet in his memory, it is appropriate that we refer also to his myriad personal fine traits in addition to the rich multitude of achievements of his long and eminent professional life. Privately, Chris was a man of amenable nature, sociable and affable, constantly keen to mentor and support those who followed in his footsteps, known for the generous qualities of mind and heart that graced his private life. He was noted for his encouragement and kindness to potential authors and students alike, always thoughtful of the welfare of those near him.

Chris was a prolific writer; PubMed lists his publications as being 318, however, this is but a pale shadow of the total when one considers the books he authored and co-authored, book chapters, conference proceedings and further published work that misses the scrutiny of PubMed. Chris was known for his enterprise, activity and self-reliance, forever striving for precision and accuracy in all he pursued. His first investigations were on radiation biology, writing on the biological effectiveness of high-energy protons and radiation depigmentation of mouse hair and the influence of local tissue oxygen tension on radiosensitivity, in 1969. A number of skin-orientated studies followed. He changed the prevailing view of the 1960s, that all cells in epithelia were cycling and regenerative, by providing clear evidence of a hierarchical cell lineage. In 1974 he described the epidermal proliferative unit (EPU) in mouse epidermis. This consists of a central stem/clonogenic cell surrounded by three divisions of transit cells, all in the basal layer, and above, a stack of differentiating cells, with senescing squames at the surface. Chris produced his first paper on the gastrointestinal (GI) tract in 1973, an estimation of proliferative cell population size in stomach, jejunum and colon of DBA-2 mice. These two tissue types (although there was also a wide range of other themes), particularly related to cancer, cell proliferation, cell death by apoptosis, and stem cells, dominated his scientific life, with a wealth of publications on anti-cancer chemotherapy and effects of therapeutic agents on the epithelium of the GI tract. He provided a biological explanation, based on differential p53/bcl-2 expression and propensity for apoptosis to delete mutated cells, for the lack of cancers in the small intestine. By mid-career, Chris became interested in mathematical modelling of cell proliferation in living tissue systems, often in the mouse and rat, although by the 1990s he had published comparative studies on proliferation measurements between rodent models and man. The adult stem cell concept was early to reach his laboratory and interest, and he performed studies on stem cells of the intestinal crypt. This work led to the identification and characterization of stem cells and their dependent lineages in the small and large intestine, and an understanding of the biological significance of apoptosis in the control of stem cell homeostasis and cancer incidence. He was the first to show that only a small number of stem cells is located near the base of

the crypt in the small intestine, and at the base in the large intestine. Chris was the first to investigate and provide supportive evidence for the immortal-DNA strand hypothesis of John Cairns, in which the parental DNA template is retained during stem cell divisions so that their mutational load is kept low. He then focussed on local stem cell regulation, developing techniques and interpretation of clonality and life cycles of cells/intestinal crypts. One of Chris's final publications concerned regional differences in stem and transit cell pro-

liferation and apoptosis in the mouse colon and ileum after irradiation.

Chris Potten married Sarah Chasmar in 1964, who sadly died prematurely in 1997. In 2002 he married Carol Griffiths, who with his three sons and two step-daughters, survives him.

Catherine Sarraf
Editor-in-Chief
Cell Proliferation