Sir Bob Elliot – "In Memoriam"

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Emeritus Professor Sir Robert Bartlett Elliott, MBBS, MD, FRACP, CNZM, KNZM

1934 - 2020

Emeritus Professor Sir Robert Elliott (affectionately known to his friends as Bob), a pioneer and entrepreneur in xenotransplantation research, died peacefully at home with his family on the morning of the 21st of August 2020. Bob's passing has caused us to reflect on his many remarkable achievements and how they have influenced medicine, in particular, how more recently they have impacted the field of xenotransplantation.

Robert Bartlett Elliott was born on the 3rd of January 1934 in Adelaide, South Australia.

He trained in medicine at the University of Adelaide, South Australia with his specialty training in paediatrics also being completed there. He was a prominent Paediatrician at the University for a number of years before his appointment in 1970 as the Foundation Professor of the Department of Paediatrics at the University of Auckland, New Zealand.

His desire to undertake medical research was always uppermost in his mind and he became internationally known for identifying the role of prostaglandin PGE2 in maintaining the ductus arteriosus, which remains an effective medical intervention today [1].He and his team went on to research various aspects of screening for cystic fibrosis in children including a method of testing stool samples from newborn babies developing dried-blood spot screening for cystic fibrosis in the newborn [2]. In 1981 New Zealand adopted the first national cystic fibrosis screening programme which has significantly extended the life expectancy of children with cystic fibrosis [3, 4].

Bob considered that his most satisfying contribution to society and medical research was the founding in 1976 of Cure Kids, a charitable organization that is a major funder of child health research in New Zealand. This was followed by the co-founding of Cure Kids Ventures to gather support from private investors to translate research outcomes into the clinic. Another major research outcome that he successfully commercialised was his A2 Milk patent, which was purchased by The a2Milk Company. Bob generously gave its significant proceeds to his Cure Kids Foundation.

Bob's interest in xenotransplantation was kindled by his drive to find a cure for Type 1 diabetes (T1D) especially in children, having a close friend and business colleague who had a son with T1D. To this end, he co-founded Living Cell Technologies (LCT) Limited in 1987 with his friend David Collinson and was instrumental in the establishment of a designated pathogen-free pig herd shown to be free from infectious agents that may potentially be transmitted from pigs to humans following xenotransplantation. Human clinical trials with encapsulated porcine islet cells in type 1 diabetes followed, demonstrating some clinical benefit but perhaps more importantly the absence of transmission of viruses including porcine endogenous retrovirus [5, 6]. Gaining regulatory approval for these trials was a long and arduous process, but

it has been of immense benefit to the development of regulatory frameworks for islet xenotransplantation. Subsequently, the research was extended to include the use of encapsulated porcine choroid plexus cells in Parkinson's disease [7].

Over the years, this research was carried out in collaboration with international colleagues including David White, Canada; Riccardo Calafiore, Italy; Wang Wei, China; Nicolai Skaletsky, Russia; Shinichi Matsumoto, Japan; and Adrian Abalovich, Argentina [8].

In 2016, Bob (with Dr Olga Garkavenko and Dr Paul Tan) co-founded NZeno Limited to develop gene edited porcine tissues for xenotransplantation. A collaboration soon followed with Professors Bruno Reichart and Eckhard Wolf, from Munich, Germany.

Bob remained actively involved in the field of xenotransplantation even into his 80's, taking active roles as a mentor and advisor to a number of international groups. He also continued to provide expertise and guidance in the development of national frameworks for undertaking clinical trials, including participating in the first IXA consensus statement on conditions for undertaking clinical trials of porcine islet products of porcine islets [9].His collaborative research extended to studies into societal perceptions of xenotransplantation, especially in relation to clinical trials and in particular the effects of exposure to and education of hospital staff involved [10].

In 2001, Bob was honoured as a Companion of the New Zealand Order of Merit (CNZM) for services to the community, and in 2020 he was awarded Knight Companion of the New Zealand Order of Merit (KNZM) for services to medical research.

Bob was exemplary in his vision and determination in both his medical and research endeavours, underpinning his belief in the requirement for long-term vision, tenacity and drive. He had the typical features of a good clinician scientist, with a combination of attributes that included being bold and ever inquisitive right to the end. In seeking solutions to the challenges that lie ahead in translating

xenotransplantation to clinical reality, we are reminded of the benefits of moving forward with beliefs while maintaining a critical review of progress.

In biotechnology, medicine, academia and medical research, Bob has left a significant legacy for future researchers and clinicians. His booming humour, enthusiasm and encouragement will be missed. His legacy provides a lasting impact on the medical sciences, in particular the xenotransplantation field, and indeed, its future patients.

Sir Bob is survived by his wife of 63 years, Lady Betsy. He was the loving and proud father of Tom, Sue, Sandy, Richard and David. Father-in- law to Gayle, Mark, Annabel, Julz and Julia. Much loved grandfather to his eleven grandchildren.

We in the field of xenotransplantation wish his family and friends condolences for their loss.

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