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Tania Samantha Douglas (1969–2021): Biomedical engineer, academic and leader

Professor Tania Samantha Douglas, leading biomedical engineer, innovator and academic, died on 20 March 2021.

Tania's untimely death, after an extended battle with cancer, came as a tremendous blow to her colleagues and students at the University of Cape Town (UCT), and to many friends and collaborators further afield. Tania was an internationally recognised scholar, admired by many and consulted broadly for her unique insights, in-depth understanding of the higher education environment in South Africa, and open-mindedness. Always vibrant, she was able to fully engage with issues in an unbiased way, sharing her well-considered thoughts in a friendly and practical way.

Tania was born to Helena (Rita) Harriet (née Volkwyn) and Aubrey Douglas on 11 August 1969 in Pacaltsdorp, a small community on the outskirts of George in the Southern Cape. After obtaining the second highest grade in the country in the matriculation examinations administered by the House of Representatives in 1987, Tania proceeded to read for a BScEng in Electrical and Electronic Engineering at UCT. This was followed by an MS in Biomedical Engineering at Vanderbilt University in Nashville, Tennessee, a PhD in Bioengineering from the University of Strathclyde in Glasgow, and a postdoctoral fellowship in image processing with the Japan Broadcasting Corporation in Tokyo. In 2000, Tania returned to her alma mater to take up a position as lecturer in the Department of Biomedical Engineering.

During her 21 years at UCT, Tania held numerous leadership positions within the department and faculty, including serving as Divisional Head for a period, leading the MRC/UCT Medical Imaging Research Unit for the past decade, and serving as Deputy Dean of Research in the Faculty of Health Sciences. In 2016, Tania was awarded the prestigious South African Research Chair in Biomedical Engineering and Innovation, and in 2018 was Founding Director of the Biomedical Engineering Research Centre at UCT. Tania excelled in all spheres of academia. She headed up a large research group, trained and graduated more than 50 master's and doctoral students, mentored postdoctoral fellows and junior staff, published extensively in leading international journals, and taught and developed courses. Her scholarly contributions were recognised through numerous awards, including research fellowships from the International Institute for Theoretical Physics in Trieste, Italy; the Alexander von Humboldt Foundation in Germany; the Erasmus Mundus programme of the European Union; and Female Academic/Researcher of the Year by the IEEE Women in Engineering South Africa section. In 2019, she was recognised at the South African Women in Science Awards as Distinguished Woman Researcher in Research and Innovation, and in 2018 as a Quartz Africa Innovator. In the past decade, she was elected a Fellow by the South African Academy of Engineering, the International Academy of Medical and Biological Engineering, and the University of Cape Town, and as a member of the Academy of Science of South Africa.

Tania's research focused on major public health problems in South Africa for which she developed novel instruments and computer-assisted techniques. Some of her early work involved developing image-processing techniques to characterise the facial phenotype associated with Fetal Alcohol Syndrome – a condition of which the incidence in certain communities in South Africa is amongst the highest in the world. Tania also made seminal contributions in tuberculosis (TB) diagnosis, including the development of a 'smart microscope' for automated detection of TB bacilli in stained sputum smears, and computer-aided detection of pulmonary pathology in paediatric chest X-rays.

Quoting her friend and mentor, Emeritus Professor Christopher Vaughan, 'Tania Douglas was a true citizen of the world, transcending geography and embracing the environment in which she found herself.' This is clearly reflected by Tania's recent work that strived to combine biomedical engineering with social context to find novel solutions towards improved health. To this end, she developed a new postgraduate programme in Health Innovation that teaches human-centred innovation, with an emphasis on end-user engagement. She believed and advocated that Africa needs to find solutions to its own problems and strove tirelessly to build biomedical engineering capacity across Africa. As part of these efforts, she played a leading role in the establishment of the African Biomedical Consortium, launched and was founding Editor-in-Chief of the open-access electronic journal *Global Health Innovation*, and edited the open-access eBook entitled *Biomedical Engineering for Africa* (University of Cape Town Libraries; 2019).

Since 2014, Tania served as Associate Editor of both the *South African Journal of Science and Medical Engineering and Physics*, and in January of this year was appointed as Editor-in-Chief of the latter.

In addition to Tania's many scholarly achievements, she impacted the lives of her students, colleagues and collaborators in a very personal way through her caring and thoughtful nature. She was warm and empathetic, and an inspiring mentor to many. The manner in which she carried her illness demonstrated incredible courage and inner strength. Having touched the lives of so many, Tania leaves a great void. This is expressed beautifully in the words of her friend and head of the Department of Human Biology, Prof. Sharon Prince, who wrote:

We will remember Tania for being an amazing woman – brave, humble and brilliant. She lived her life, and carried her illness, with extraordinary grace and dignity. We will remember her for her astute intellect and her quiet humanity to build others in the process. She was talented and gracious, and we will remember her positive attitude and ever-present beautiful smile.

Heartfelt condolences to her parents, Aubrey and Rita Douglas, and other members of her immediate family.