BRENDA DIANA WINGFIELD

TOP THREE AWARDS

- HF Oppenheimer Fellowship Award, 2016
- Christiaan Hendrik Persoon Award (Gold Medal) of the Southern African Society for Plant Pathology, 2015
- African Union Regional Award for Women in Science, 2009

DEFINING MOMENT

When genes captured her imagination and directed her course of study.

WHAT PEOPLE DO NOT KNOW

I really am an introvert, all the tests show this BUT I have learned to improve on my abilities to deal with others. Having an extrovert husband has helped.

RARE SKILLS AT WORK

Professor Brenda Wingfield's research occupies a critical point in the wider field of biology: the intersection of biochemistry and genetics, being highly qualified in both fields. It is not surprising, then, that in addition to being a Professor of Genetics, she also holds (or has held) the Directorships in the University of Pretoria of the Molecular Screening Co-operative Programme and the Forest Molecular Biology Co-operative; and is a Programme Leader of the DST/NRF Centre of Excellence in Tree Health Biotechnology.

Being modest about her positions, though, she points out that both biochemists and geneticists are hesitant about her claims to having skills in both areas. Her qualifications, and considerable applied experience, however, give the lie to such hesitancy: she holds a Masters degree in biochemistry, statistics and genetics, and a PhD in microbiology which place her in the ideal position to undertake her award-winning, internationally recognised research in the fields of molecular mycology and (more broadly) plant pathology.

Wingfield was born in Northern Rhodesia (Zambia) and grew up in Southern Rhodesia (Zimbabwe), one of four children of an engineer – and was fortunate enough to be taught high-school biology by an exceptionally skilled and well-educated teacher. It was in these classes that she encountered not just general biology but 'genes' which captured her attention – and her imagination – a defining moment in her early years, which served to direct her into her chosen fields of study and research.

As did all high-school students in Zimbabwe, she wrote the United Kingdom school-leaving examinations and then a local examination – the M-level – and was the only student in her cohort to achieve a first-class pass in biology. Determined to study genetics, Wingfield enrolled for an undergraduate degree in the University of Natal in Pietermaritzburg and completed a BSc majoring in biochemistry and genetics.

TACKLING MEDICINE

By then, however, she had come to realise that without some medical knowledge, it would be very difficult to pursue her interest in genetics and, since she had no intention of becoming a medical practitioner, she enrolled for a BSc Hons (Medical) degree at the University of Cape Town (UCT). As good fortune would have it, her arrival in the Department coincided with Professor Wieland Gevers' appointment and, although he wasn't her supervisor, it was he who created opportunities for her and her fellow students by encouraging and supporting them and spending considerable time with the students.

Wingfield recalls Gevers saying that he kept a copy of the most recent issue of *Nature* on his bedside table – something that made her think a good deal more consciously about what it might mean to be a serious academic.

She is disarmingly self-effacing about the next stage in her academic career. Her boyfriend, Mike Wingfield, had completed a Masters degree in plant pathology at the Stellenbosch University (SU) and was sponsored to undertake a PhD at the University of Minnesota. They agreed that Brenda should accompany him to the United States, and the only way in which this could be done was as his spouse.

At the age of 21, they were married and set off to St Paul (home to the Agriculture Campus of the University of Minnesota). For the first six months in the States, Wingfield describes herself as having been "a lady of leisure" and concentrated on improving her sewing skills by taking classes. When, however, her husband was required to complete a course in statistics, he suggested that she register for the course in order to study together. The course turned out to be a critical moment in her career: from sewing to statistics to scientist. She so enjoyed the course that she went on to register for the following course in statistics and then registered for a Masters degree in biochemistry, with supporting courses in genetics and statistics.

It was also a critical moment in another sense, as it was the beginning of what has since become a lifelong, highly productive and complementary research partnership between the Wingfields.

She completed her Masters degree under the supervision of Dr Thomas Guilfoyle in 1984 and returned to South Africa, taking up a position as re-

search officer in the Department of Biochemistry at UCT, headed by Claus von Holt, where she ran the Recombinant DNA laboratory, undertook the first DNA sequencing project in the Department, and advised graduate students on the recombinant DNA aspects of their research projects. In the course of her research at UCT, she worked with colleagues in the Department of Microbiology (headed by David Woods) including Frank Rob, Doug Rawlings and Ed Rybicki. She subsequently moved to the Institute for Biotechnology at SU joining the staff as a researcher, and working with Professor Hennie van Vuuren. In this position, she was instrumental in establishing the SU Recombinant DNA laboratory and the microbiology research system which she then ran.

In 1986, six months into her first pregnancy, Wingfield registered for a PhD degree in microbiology at the SU studying killer and neutral wine yeasts under the supervision of Professor Izak Pretorius. Four years later, she completed her PhD – six months into her second pregnancy. It was clearly a time of demanding scientific research and motherhood, which Brenda characterises as one of great opportunities and excitement.

By this time, Brenda had moved (following her husband, she wryly remarks) to Bloemfontein where she was appointed as a lecturer and researcher in the Department of Microbiology and Biochemistry in the University of the Free State (UFS). In her nine years at UFS, Brenda was promoted to a senior lectureship and then to an Associate Professorship, in which position she and her colleagues set up a molecular taxonomy programme that focused on rRNA and rDNA sequencing that was relevant to the work of research groups in the department.

MULTIPLE DIRECTORSHIPS

In 1998, Wingfield was appointed as a full Professor in the Department of Genetics in the University of Pretoria (UP). In 1994, while still holding her Professorship, she took up the Directorship of the Molecular Screening Cooperative Programme; in 1999, the Directorship of the Forest Molecular Biology Cooperative Programme and, in 2004, the Programme Leadership of the Department of Science and Technology/National Research Foundation (DST/NRF) Centre of Excellence in Tree Health Biotechnology. From 2009 through to mid-2016, and while continuing her teaching and research, Brenda was the Deputy Dean for Research in the UP Faculty of Natural Agricultural Sciences and was, for about seven months, the Acting Dean of the Faculty.

Her status as a research scientist is evident not only by her 350 accredited publications and hundreds of popular articles and commentaries, but also by the substantial number of invited lectures she has given, and the more than 45 international research visits she has made over the past 25 years. She undertakes all her work on the basis that excellence is the only benchmark of significance, a lesson she learned working in departments with a strong research ethos – such as those at UCT, SU and Minnesota – and now at UP.

In this light, she is of the view that she has yet to make her most significant contribution to science – although she is most proud of having been the first African researcher in Africa, to have sequenced a fungal genome using an African laboratory, demonstrating that this could be done without 'outsourcing' the sequencing to the global north.

One of Wingfield's great passions is, in fact, promoting the importance of scientific research being undertaken, and seen through to completion, in Africa. She believes that 'outsourcing' the finalisation of research processes to the global north leaves Africa out of worldwide competition and research networks, and that as long as that situation is perpetuated, African science will always be seen to be second best, when there is no reason for this to be so. In line with this lies her commitment to supporting as many postgraduate students as possible, in order to contribute to a growing cohort of young scientists who share her commitment to excellence, and to strengthening scientific research outputs in Africa.

In addition to being a leading scientist, Brenda Wingfield is an active supporter, and member or fellow, of some 30 scientific and scholarly associations. In 2008, she was elected as a Fellow of the Royal Society of South Africa and in 2009, The World Academy of Sciences.

She is also a committed, effective (and valued) teacher, having consistently presented undergraduate courses; nurtured (so far) close to 50 Honours students and supervised 52 MSc and 57 doctoral students.

Her message to these young scientists is, of course, about excellence, and has also been about the privilege and joy that an academic career brings to those who are fortunate enough to follow it. She encourages her postgraduate students to follow her example of ensuring that she plans each day, week and month so as to maximise having fun – enjoying the excitement and rewards of high-level research. She is firmly of the view that losing the sense of pleasure that scientific work offers is often a signal that the time has come to follow a different career.

She considers herself fortunate to have found herself working in close cooperation with her husband, and she reminds her students that they should think carefully about the partners with whom they chose to spend their lives. Mutual support, and a recognition of the complementary skills on which a team can draw, go a long way, she believes, in furthering research success – and, of course, excellence. Into this mix, she adds personal strengths that partners can bring to their careers. She considers herself to be inclined to be introspective, although anyone who knows her would hardly guess this to be so. But working in a team has, she points out, more than compensated for that trait.

Wingfield's career has been and continues to be rich and diverse – and difficult to characterise in terms of highlights since there are so many. Perhaps, though, there are a few moments or developments that mark key points in her life and work.

Undoubtedly, the first of these would have to be her introduction to genes (and their DNA bases) and genetics as a high-school student – thanks to an inspiring biology teacher. Brenda's teenage fascination with the field led to her decision to follow this area of research and influenced each of her subsequent academic choices, and her successful career.

In her formative years, she encountered leading South African and international scholars in her field and made the most of those experiences, learning more than just the 'science'.

And then there is Wingfield herself: happily aware of the privileges that come with an academic career, full of laughter and *joie de vivre*, and totally committed to supporting the next generation of scientists in her field – inspiring them with her own sense of the importance of scientific discovery. In this regard, she is determined to continue her work as long as she possibly can, the notion of reaching the peak of her work at 60 being both unrealistic and unacceptable.

All told, a rare combination of circumstances, commitment and character, which have informed and shaped her life and her remarkable achievements.