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SA scientist one of the top five female physical scientists

South African scientist Professor Tebello Nyokong scoops 2009 L'ORÉAL-UNESCO For Women in Science Award

Dr Janice Limson

Announced on November 10, South African scientist Professor Tebello Nyokong has become the first South African scientist to win the L'ORÉAL-UNESCO award for women in science for research in physical sciences.

Now in its 11th year the awards honour exceptional women in science from around the globe. Each year one laureate is selected from five world regions. Professor Nyokong is the laureate for Africa and the Arab states for 2009.

This year, the theme of the awards is "Physical Sciences", and the Laureates were selected through nominations by a network of nearly 1,000 members of the international scientific community. Diverse in origin, determined in nature, and extraordinary in intellect, the 2009 Laureates reflect the programme's mission: change the face of science and support the advancement of women in the scientific field.

Based at Rhodes University, one of South Africa's leading tertiary institutions, Nyokong was honoured for her work on harnessing light for cancer therapy and for environmental clean-up.



L'ORÉAL-UNESCO women in science laureate Professor Tebello Nyokong. Photo by Cathy Pinnock.

Versatile molecules

Nyokong's research centres around compounds known as porphyrins. These are highly coloured compounds; the blue dye used in jeans are based on porphyrins, while blood owes its red colour to haemoglobin, also a porphyrin. With immense potential as catalysts of chemical and biological reactions they have found widespread applications. Porphyrins have been used as potent therapies for cancer and have been used in developing highly sensitive sensors for detecting pathogens. Owing to their broad catalytic nature and optical properties, porphyrins have also been used in cleaning of polluted water. The real trick is turning these applications into a reality.

By altering the chemical structure of these compounds, through changing the metal centre, adding substituents or coupling them with enzymes or nanoparticles such as quantum dots it becomes possible to finely tune and manipulate the properties of these

molecules. And it is here where Nyokong, the NRF/DST Chair in Medicinal Chemistry and Nanotechnology at Rhodes University has led the field, pushing the frontiers of porphyrin based research in a career spanning almost thirty years.

Porphyrin based cancer drugs developed by Nyokong and her team over several years are currently in research trials in South Africa. Research in early warning systems for diseases and environmental toxins, has resulted in the development of several sensors, notably the most sensitive detection system yet developed for the neurotransmitter nitric oxide. As director of the DST/Mintek Nanotechnology Innovation Centre -Sensors based at Rhodes University in South Africa she is continuously pushing the boundaries with current research efforts aimed at targeting and detecting cancer causing agents *before* they can do harm in the human body.

A wall of awards

Nyokong's office walls are covered in photos and awards, having been the recipient of just about every major national award in South Africa including the Order of Mapungubwe, bestowed on her by the president of the country, the Shoprite/Checkers Woman of the Year award for science, and this year the 12th annual City Press/Rapport Prestige Award as one of the "Ten Women of Excellence" in South Africa. Closer to home, at Rhodes University she was the winner of the Vice-Chancellor's Distinguished Senior Research Award in 2003, being not only the top publishing scientist at the university but one of the top publishing scientists in the country.

Professor Peter Clayton, Deputy Vice-Chancellor for Research at Rhodes concurs. "It is difficult to imagine a scientist who has achieved more than Professor Nyokong in recent years in terms of productivity across the full range of scientific achievement: her outstanding contribution to the advancement of science, her international collaboration, her enviable publication record, her capacity building with young scientists, her promotion of the public understanding of science, and her contributions to the national system of scientific development. What she has achieved is quite staggering. She literally oozes passion for science – doing it, teaching it, promoting it, financing it, and applying it."

Now judged for her profound impact on the global scientific knowledge economy in physical sciences by an awards jury made up of Nobel Prize laureates including Nobel prize for Chemistry 1999 recipient Professor Ahmed Zewail (who serves as the Jury President) and Professor Christian de Duve, who received the Nobel Prize in Medicine 1974, she and the four other winners will travel to Paris in March 2009 to each accept the award and the generous prize money of close to ZAR 1 million.

Humble scientist

Those close to Nyokong will know that like the molecules she works with, these accolades have simply catalysed her to reach greater heights in research, and this award will be no different. And her students know only too well that this humble scientist will continue to deflect attention away from herself and onto her students. In fact, the night Nyokong received the phone call in early October breaking the news of this award to her, she was at a university event initially planned to honour her recent scientific achievements following a local award which was bestowed upon her. However, Nyokong had insisted instead that the event rather be held in honour of her former and present postgraduate students.

As a representative of this group of former and current students, we hope that this time she will accept this award for what it is and for who she is - an outstanding role model to

a new generation of scientists and as one of the five most outstanding women scientists in physical sciences worldwide.

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