ECU: EXPANDING RESEARCH FOCUS

Health research at ECU will take a major step forward in January 2012 when Professor Wei Wang rejoins the faculty, 10 years after completing his post-doctoral research, to initiate a program of research in glycomics. This is one of the highly specialised fields in molecular biology that has only appeared in the past 20 years since genomics – the study of genes – became established as one of the most exciting and rewarding endeavours in biological science.

"ECU has already achieved a widely-recognised reputation in genomics, and in proteomics, which investigates proteins," Professor Wang says. "Glycomics, which studies sugars in an organism, has so far not been prominent at the University. "As an ECU Research Fellow, my initial objective will be to build up a team to work on glycomics."

The sugars found in organisms, known collectively as glycomes, play a significant number of critical roles in the human body. Glycoproteins on the surfaces of cells are important for bacterial and viral recognition; they determine some of the pathways in cancer development; and they are implicated in a number of diseases, such as metabolic syndrome.

"My most recent paper was with a research team investigating N-glycans as a biomarker of metabolic syndrome," Professor Wang says. "This was a big team drawn from institutions in China, Croatia, the United Kingdom and Australia, in which I represented both Capital Medical University in Beijing and ECU's School of Medical Sciences. We studied populations of 212 Han Chinese compared with 520 Croatians from the island of Korčula."

"Glycan study is a frontier area in epigenetics, and this research showed that variations in the composition of the N-glycome in human plasma could reliably reflect alternations of human metabolism in two very dissimilar populations, and could represent potential biomarkers of metabolic syndrome. Excellent replication of results between the Han Chinese and Croatian populations was observed."

Professor Wang's worldwide academic relationships, particularly strong in China, are a foretaste of the collaborations and joint projects he expects to develop at ECU. He was previously the Dean of the School of Public Health and Family Medicine at Capital Medical University (CMU) in Beijing and holds an adjunct professorial position at the College of Life Sciences within the Chinese Academy of Science's Graduate University.

"CMU is one of the largest medical institutions of its kind in China," he says. "It has 10 schools, 14 affiliated hospitals and a teaching institution that, between them, have a staff of about 20,000 and more than 9,000 enrolled students. I believe there will be very good opportunities for partnerships between ECU and CMU."

"Glycomics is a significant area of medical science with high research potential and a likelihood of attracting substantial grants and a contingent of PhD students. With the background of established work in genomics and glycomics ECU will certainly maintain existing collaborations with Chinese colleagues, of which the paper on screening for novel biomarkers for metabolic syndrome, published by the highly regarded Journal of Proteome Research, was just the most recent example."

Highly consanguineous relationships are often a feature of remote or isolated populations, and are particularly interesting in genomics because of the variations that can become established, compared with mainstream populations that historically have seen a regular influx of new genes. Professor Wang has based much of his research in this area over the years.

"A decade ago when I was undertaking post-doctoral research at ECU with Professor Alan Bittles, the focus was on genomic profiling of an Indian consanguineous population. More recently we have worked together on genomics in isolated populations, such as Chinese Muslim minority groups and some Indian casts, particularly in biomarker screening."

"My principal interests lie in human genetics and public health where I specialise in medical genetics, genetic epidemiology, population health, inbreeding studies and paternity testing."

His interests and achievements have opened the door to a multitude of international bodies. He sits on the editorial boards of many of the world's leading genomic publications, such as the Journal of Medical Genetics and Genomics, the International Journal of Nutrition and Metabolism, the Australasian Medical Journal, the Human Genome Organisation Journal (of which Professor Bittles is also a board member), the American Journal of Molecular Biology, the Journal of Global Health and the Journal of Infectious Diseases and Immunity.
When it comes to remoteness, few communities can compare with those on Western Australia's beautiful Dampier Peninsula. It is 214 kilometres from Broome to Ardyaloon, on the tip of the Peninsula, along the unssealed Cape Leveque Road – a journey that can take more than 8 hours in some seasons.

"Isolation means these communities have significantly less access to necessary community services than most Australians," says Dr Andrew Guiffoyle, Senior Lecturer in ECU's School of Psychology and Social Science. "Nevertheless, they face some complex problems and have the same needs and rights for assured access to all the modern services of medical and mental health, education and child support that we take for granted in a metropolitan area."

Dr Guiffoyle is engaged in a research project in this remote region that aims to improve the provision of services to parents in Aboriginal communities. Their main research framework is PAR (Participatory Action Research), he says. "It's a very powerful methodology, though perhaps not well utilised in social research in Australia."

As an educator, author and researcher he is a persuasive advocate of PAR, and has the runs on the board in demonstrating its effectiveness.

"I applied PAR in remote areas in 1998 to help establish the Derby Aboriginal Health Service for the West Kimberley region," he says. "Between 2006 and 2009 I designed a PAR model to help the Injury Control Council of WA build more resilient communities in the State's south-west region. After intensive planning and consultation in six country towns, community groups became empowered to implement actions that would improve mental health, particularly among Aboriginal and other minority and marginalised people."

His latest project returns to the West Kimberley, with funding from FaCSIA (Department of Families, Housing, Community Services and Indigenous Affairs) through which he will support Save the Children Australia to evaluate and improve Indigenous parenting support services at four Bardi Jawi communities on the Dampier Peninsula, at Booga Bay, Ardyaloon (known also as One Arm Point) and the twin communities of Lombadina and Djarindjin. Along with outstations, the Bardi Jawi People number some 1,200, men and women.

Their long traditions, ancient culture and strong connection to country were evident in a 15-year struggle for native title not only to the land, but to the seas-lands, islands and reefs as well, which was recognised by the Federal Court in March, 2010.