

## The Advantages of an Interdisciplinary Structure: Griffith University as a Case Study

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Griffith University, with five campuses spread across the Brisbane-Gold Coast corridor and home to over 43,000 students (1,800 higher degree research students), is just 40 years old. It was established in 1971 and officially opened in 1975. Its foundation was based on a deceptively simple brief: to offer an alternative university experience to that already available in Queensland and other parts of Australia.

The original Griffith Council developed a philosophy, not only to provide specialized academic courses, but also to emphasize the general educational development of students. Central to this was the creation of theme-oriented schools. These schools were multi-disciplinary with groups of disparate scholars integrating their research and teaching in problem-solving units. For example, Griffith was the first Australian university to offer Environmental Science and Asian Studies degrees.

It was the interdisciplinary structure that attracted me to Griffith University in 1990 to start my academic career (as a Lecturer in Chemistry in the School of Science) as I viewed it as the ideal environment to develop my interdisciplinary research interests in biological inorganic chemistry. The structure facilitated the interactions between scientists with diverse research interests. I witnessed many occurrences of innovative new interdisciplinary projects stemming from conversations in the single common room, which was located between the three buildings that housed academics interspersed in offices across the breadth of STEM disciplines in chemistry, physics, mathematics, biology biochemistry, IT and microelectronic engineering. In 2001 I moved to the University of Western Australia, as the foundation Professor of Biological Chemistry, and was struck by the contrasting barriers to developing interdisciplinary collaborations from the confines of a single discipline Department of Chemistry in a traditional, well-established university.<sup>1</sup>

One example of the success of the original Griffith structure in fostering interdisciplinary research has been the work of my colleague Professor Ron Quinn, an organic chemist specializing in marine natural products, who is director of the world renowned Eskitis Institute for Drug Discovery.<sup>2</sup> The Institute searches for and develops new drug- and cell-based therapies in areas such as cancer, infectious diseases, neurological diseases and global health. It began life in 1988 with the establishment of three research centres within Griffith University aiming to undertake early stage drug discovery, neurobiology and cell biology research. The research

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<sup>1</sup> I returned to Griffith University in 2009 to take up the role of Pro Vice Chancellor (Science, Environment, Engineering and Technology) before moving to my current role as Dean of the Graduate School in 2012

<sup>2</sup> See <http://www.griffith.edu.au/science-aviation/eskitis-institute>.

is supported by the unique Nature Bank resource,<sup>3</sup> a storehouse of chemical diversity from the natural world which encompasses a library of over 200,000 optimized natural product fractions derived from a diverse collection of over 45,000 samples of plants and marine invertebrates. The Institute provides an outstanding environment for interdisciplinary graduate research and currently hosts 59 higher degree research students with around one third from outside Australia.

A further case study for how the Griffith University structure has fostered the growth of interdisciplinary research and collaboration across STEM disciplines is exemplified by the career of Mark von Itzstein, who was a graduate of one of the first cohorts of students in the interdisciplinary School of Science at Griffith, going on to complete a PhD in chemistry in 1985. He subsequently joined the Department of Medicinal Chemistry, Monash University, as an independent research leader and led the chemical biology research program that discovered the anti-influenza drug, Relenza®, for which he was jointly awarded the Australia Prize in 1996.

In 2000, Prof von Itzstein returned to Griffith University to establish and head the Institute for Glycomics,<sup>4</sup> which is one of only a few multi-disciplinary glycoscience research centres in the world. The Institute provides a multidisciplinary approach to drug and vaccine discovery research as well as a multidisciplinary approach to research and education, spanning medicinal and computational chemistry, various biological and physical sciences. This approach presents an exciting platform for the control of a wide-range of medical conditions such as cancer, diabetes, infectious diseases, inflammation and immune disorders.

The Institute for Glycomics has a broad scientific staff profile of approximately 150 researchers including a cohort of > 35 PhD students. As for the Eskitis Institute for Drug Discovery, the Institute provides the ideal environment to prepare the next generation of research professionals to conduct research and collaborate beyond the bounds of one discipline. Interdisciplinary collaborations develop naturally and joint supervision arrangements are readily put in place by having a critical mass of researchers, from disparate disciplines, focused on a common goal to bring forward novel drugs and vaccines to the community. The graduate students have access to state-of-the-art co-located research facilities covering biology, chemistry and the structural and analytical sciences that enables research translation from bench to bedside.

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<sup>3</sup> See <http://www.griffith.edu.au/science-aviation/eskitis-institute/nature-bank>.

<sup>4</sup> Research at the Institute for Glycomics, is based, in part, on the study of carbohydrates or sugars (*glyco* – the Greek prefix for sugar). Carbohydrates are involved in many biological processes and particularly in disease. See <http://www.griffith.edu.au/science-aviation/institute-glycomics>.