



14<sup>th</sup> February, 2001

The Committee Secretary  
House of Representatives Standing Committee on Primary  
Industries and Regional Services  
Parliament House  
CANBERRA ACT 2600.

**INQUIRY INTO THE DEVELOPMENT OF HIGH TECHNOLOGY  
INDUSTRIES IN REGIONAL AUSTRALIA BASED ON BIOPROSPECTING**

**A Submission from:**

**Professor Andrew J. Beattie  
Key Centre for Biodiversity and Bioresources  
Department of Biological Sciences  
Macquarie University  
NSW 2109**

The Key Centre has been developing new methods for bioprospecting known as Evolutionary Trend Analysis (ETA). Scientists in the United States refer to similar methods as “ecology-driven bioprospecting”. At present they focus on pharmaceuticals, especially antimicrobial compounds and are based on two closely related ideas from evolutionary biology and ecology. The first is that specific molecules such as antimicrobials have evolved repeatedly and are deployed in a wide variety of ecological situations. This suggests that the primary methods of bioprospecting are derived from evolutionary biology and ecology. Second, although we are in the era of combinatorial chemistry, it is reasonable to suggest that evolution by natural selection is a natural analogue of this process that has been operating for hundreds of millions of years. Again, this suggests that the first phase of discovery is likely to be enhanced by the use of evolutionary and ecological modes of thought, employing the vast databases of natural history.

These are not mere academic assertions as my research team has been funded by the Australian Research Council and is currently funded by GlaxoSmithKline. Our project is to explore the assertions in depth and to place the initial phases of bioprospecting on to a more scientific footing by generating hypotheses that guide the direction of commercial exploration. It is hoped that this will avoid the pitfalls of other methods of bioprospecting that remain unfocused, cost-ineffective and liable to fail.

We have a team in which evolutionary biology, ecology, microbiology and natural products chemistry are represented. As a result of the protocols we employ, we are exploring a wide range

of habitats and organisms that, once we are in full swing, will likely involve many parts of Australia. Our first hypothesis proved promising and resulted in a patent application. With new personnel and funding from industry, we plan to develop ETA in to a more commercially viable enterprise.

While these methods have been focused chiefly on antimicrobial compounds, they should be applicable to a very wide range of industrial products well beyond the pharmaceutical industry. This is the subject of a new book from Yale University Press. In fact, research teams around the world are beginning to take advantage of the modes of thought encapsulated by ETA with the result that an unexpected even astonishing variety of organisms are emerging as the basis of important new products and industries.

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Contact details:           Phone: 02 9850 8153  
                                      Fax: 02 9850 9237  
                                      Email: [abeattie@rna.bio.mq.edu.au](mailto:abeattie@rna.bio.mq.edu.au)  
Website:                     [www.bio.mq.edu.au/kcbb](http://www.bio.mq.edu.au/kcbb)

