

EDUCATION THEN AND NOW: WHAT'S REALLY CHANGED?

Guest Editorial

The painting on the front cover shows that lectures have been used as a method of imparting knowledge since at least the 14th century. Perhaps the biggest difference between this picture and the present situation is that for most of us, class sizes are much bigger (and of course, classes now include females as well as males). The dominance of lectures for over 700 years implies that they are an effective teaching method. But is this assumption justified? Educational research would suggest that it is not. It is increasingly clear that for effective learning to take place, students must be actively involved, for example, by questioning, analysing, solving problems or creating. By contrast, lectures encourage a passive approach, where many students completely fail to engage with what is presented (also shown in the painting!).

Despite considerable evidence supporting the value of active engagement, many science courses are still taught in a largely traditional lecture and laboratory mode, leading to the criticism that scientists are not approaching their teaching scientifically (1). While this might be true on a larger scale, it is certainly not true of many biochemistry and molecular biology educators in Australia. We have an active community of educators who do consider evidence-based approaches to learning outcomes and the articles in this issue offer some insights into innovative teaching strategies and the value of educational research. Liz Johnson provides an excellent overview of the student-centred approach, where learning and teaching is focussed on the needs and interests of the student, rather than those of the teacher. She

illustrates the benefits of this approach to both staff and students. A student-centred perspective was crucial to the successful restructure of a first-year biology course described by Ian Menz and Karen Burke da Silva. The restructuring involved paying more attention to different student backgrounds, including more active learning and linking labs, tutorials and lectures more effectively, resulting in significant improvements to student learning. Brett Lidbury and Felicia Zhang have adopted language teaching strategies to engage students with the ever-expanding vocabulary of molecular biology, helping them de-mystify primary literature. Finally, the team led by Tony Wright and Susan Hamilton discusses a tool that can be used to assess student conceptual understanding, the concept inventory. They also show how a greater knowledge of what students think can then lead to enhanced teaching strategies and improved learning outcomes.

These articles show just a few of the exciting things that are happening in biochemistry and molecular biology education in Australia. The range of different activities nicely demonstrates that we have moved well past the traditional reliance on lectures. The state of biochemistry and molecular biology education in Australia is both scientifically and educationally sound, and well grounded in the 21st century.

1. Handelsman, J., Ebert-May, D., Beichner, R., Bruns, P., Chang, A., DeHaan, R., Gentile, J., Lauffer, S., Stewart, J., Tilghman, S.M., and Wood, W.B. (2004) *Science* **304**, 521-522

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Cover Illustration

A mediaeval lecture by Laurentius de Voltolina, ca 1355.
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Education Guest Editor: Susan Howitt

- 5 What is 'Student-Centred Learning' and Why Should We Care?
Liz Johnson
- 7 Inspiring Students to Study the Molecular Life Sciences
Ian Menz and Karen Burke da Silva
- 10 Comprehension of Scientific Language as a Strategy to Enhance Learning and Engagement for Molecular Biology Students
Brett Lidbury and Felicia Zhang
- 14 A Concept Inventory for Molecular Life Sciences: How Will it Help Your Teaching Practice?
Susan Howitt, Trevor Anderson, Manuel Costa, Susan Hamilton and Tony Wright

In the next issue...

In April, Showcase on Research will be on **Apoptosis** – Guest Editor: John Silke

Australian Biochemist – Editor Rebecca Lew, Editorial Officer Liana Friedman

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