

# Making and Using Computer Animations to Teach Biology

*Alan W. Day<sup>1</sup> and Robert L. Dean<sup>2</sup>*

Departments of Plant Sciences<sup>1</sup> and Zoology<sup>2</sup>

University of Western Ontario

London, Ontario N6A 5B7

(519) 432-5800<sup>1</sup>

aday@julian.uwo.ca

Complex scientific processes and topics are much easier to visualize and understand when presented as continuous events with dramatic and colourful 2D and 3D graphics and animation. The authors have developed over 60 animation lessons on many of the important processes of *molecular biology* (e.g., DNA replication, cloning, sequencing, PCR, site-directed mutation, intron removal, etc.), *cell biology* (e.g., nerve and muscle action, photosynthesis, voltage-gated ion channels, electron transport in mitochondria, G proteins, etc.) and *genetics* (e.g., Mendelian genetics, translation, spontaneous mutation, tetrad analysis, mitotic recombination, gene conversion, Holliday model, etc). Each animation provides a detailed 15–20 minute lesson with striking graphic images to make the material interesting and memorable. Student response to use of these animations in lectures and labs as well as for self-study has been enthusiastic and we have noticed a marked improvement in their comprehension of basic processes. Lecturers can quickly learn and use animation software to make their own animated lessons.

Animation lessons have been used for 3 years as a key component in a large introductory cell biology/genetics class at the University of Western Ontario. We have developed a program called *Visual Genetics*, that is a unique graphics-based comprehensive genetics “text.” This program features seven major topics (e.g., Recombination and Mapping) in *each of which* the student can select from over 60 animation lessons, 30 multiple choice questions, 12 problem solving questions, reference material, diagrams to label, or make and save their own notes, etc. Each instructor can also *customize* the program to accept their own questions and notes/comments. The animated lessons are available from the authors for \$10–\$15 CDN per title in versions for MS-DOS or MacIntosh computers. The *Visual Genetics* interface requires Windows 3.x on an IBM-compatible computer.