LTSN BIOSCIENCE
BULLETIN

http://bio.ltsn.ac.uk/

ltsn
Learning and Teaching
Support Network
Bioscience

CONTENTS

WANTED
COURSEWARE REVIEWERS
The LTSN Centre for Bioscience is looking for colleagues in the UK to review course software, books and other teaching resources that are made available to the Centre. Reviews will be made available to the biosciences community on the usefulness and practicality of courseware. We are constructing a database of courseware reviewers and their interests. If you would like to join the team please register your interest with the Centre at: *http://bio.ltsn.ac.uk/*

EDITORIAL

THE LEARNING AND TEACHING SUPPORT NETWORK (LTSN) CENTRE for Bioscience, based in the University of Leeds with partner sites in Liverpool and Aberdeen Universities, is now fully up and running and this is our first *Bulletin.* We are part of the nationwide network of 24 discipline-specific Subject Centres, linked in also with the LTSN Generic Centre and funded through the funding bodies for at least 5 years. Elsewhere in the *Bulletin* you will find a list of our staff (and their responsibilities) as well as telephone numbers, e-mail addresses and the website address. We aim to be of service to the bioscience community in the UK who teach to undergraduates by providing access to a *Knowledgebase* (a repository of materials and information which will enhance all aspects of learning, teaching and assessment), forming networks to facilitate communication and the spreading of good practice, and offering advice about innovative teaching methods by departmental visits, workshops and conferences. We have strong links with many of the learned societies, many of whom already have education groups or sections of their own. This will give us a presence at conferences to meet people and exchange ideas. We have a major challenge before us to carry out our proposed activities to cover the whole spectrum of learning and teaching in the biosciences — a vast topic area and one that is expanding exponentially at the present time. We need your input and ideas to inform us of what needs there are and to identify good practice already in use and promulgate it. In addition to carrying out our own activities we have some funds to support activities that involve the development of innovative teaching developments (see page 6). We hope that as many people as possible will register their activities (see the website for how to do this), and that people will contact us by whatever method is most suitable for them to keep us informed of what is going on in the bioscience teaching community.

The *Bulletin* will appear four times a year and we welcome articles, suggestions for articles, and comments on what we are doing. The articles are intended to stimulate thinking about teaching possibilities and to give people a forum to display their wares, successes and concerns. The present issue gives information about the *Knowledgebase*, about changes to the 'A' level system that are about to hit us, about the video programmes available in the *Shotlist* series, about a video project on food science and technology, about TLRP (Teaching & Learning Resource Packs), and about SEED (Science Education Enhancement and Development). We hope you find the contents interesting and that they stimulate you to be innovative: if they don't then please tell us what we should change or write an article yourself! We also need courseware reviewers who have the experience to evaluate teaching and learning materials for the benefit of others. Please let us know if you see yourself in this role: we'd love to hear from you. We aim to be knowledge brokers, bringing people with experience and people with needs together in order to improve the quality of learning and teaching in the biosciences. This is not to say that these are presently bad: but we can always improve especially if we try to think about what our objectives are and are prepared to contemplate non-traditional ways of doing things. Teachers have a major responsibility of training the next generation of biologists: our aim is to help in this process in whatever way we can.

Ed Wood and Ian Hughes
Director and Co-Director
Learning and Teaching Support Network
Centre for Bioscience

INTRODUCING THE LTSN CENTRE FOR BIOSCIENCE KNOWLEDGEBASE

The development of LTSN Centre for Bioscience Online Services is proceeding through three phases. Phase 1 has seen the creation of a LTSN Centre for Bioscience website (http://bio.ltsn.ac.uk) containing information about the centre. Assimilation of existing CTI site content into a resource archive and is largely complete.

The next phase will see a fully operational online information service (the 'knowledgebase'): the current pilot of the knowledgebase can be accessed via a link on our homepage. As the knowledgebase evolves it will provide rapid access to evaluated information on a wide range of strategies and products covering all aspects of learning, teaching and assessment in the Bioscience area. The content will be of various types including: educational objects (electronic/physical), resource descriptions with guidance as to how they can be accessed (generally URLs) and documents such as newsletter items and articles, primers, teaching protocols. The overall aim is to facilitate quick and easy retrieval and non-profit reuse.

SEARCHING THE KNOWLEDGEBASE

At the top of the knowledgebase hompage page is a buttonbar that links to a number of generic record sets in the knowledgebase, including News and Events. The *Quick Search* option below the buttonbar permits searching of the title, authors and summary field of knowledgebase entries: searches can be made more specific by concatenating search terms with a '+' symbol. More sophisticated searches e.g. by academic level, publisher or hardware type can be carried out via the Advanced search page accessed via *Search +* in the tool bar.

The Browse button allows you to identify records by one or more subject areas and record types. For the moment the majority of records are of the courseware (software) record type reflecting our CTI legacy and this will change in due course. A third selection field label labelled 'Pedagogy' is also available but currently not indexed in the knowledgebase. This encompasses concepts such as group-based learning and project work. The LTSN is in the process of adopting a common set of descriptors for this field to facilitate cross-searching between Subject Centres and we are awaiting the outcome.

SUBJECT PAGES

In recognition of the tribal nature of the LTSN Bioscience constituency, we have also compiled a series of Subject pages that we hope will evolve in response to demand and user feedback. As their name suggests, these pages provide a subject-specific view of the knowledgebase. While the options on these pages reflect those in the main buttonbar, they always build a subject area into the query so that a specialised subset of records is returned. You can set your Subject page preference by going through the using the *Set default* link on the homepage and then use the *default* button in the buttonbar to return to your chosen Subject page. The Subject pages are presently under construction but the Pharmacology page is probably the most advanced.

EASY RETRIEVAL OF RESOURCES

Whether you use the browse, search or Subject page entry points, you will normally generate a list of records that are presented in batches to browse. The list includes a brief summary and links to relevant Web pages. Selecting a particular record via the *More…* link presents a more detailed view. In a few cases, most notably for a series of Pharmacology-related PowerPoint presentations, there are also links to downloadable files. These are held on our anonymous FTP site and can be accessed directly via *files* in the buttonbar. When browsing you may want to retain a record for a subsequent more detailed appraisal. The summary list of records provides a checkbox for each record. Selecting this and then the button labelled *Copy to Clipboard* allows you to maintain a temporary list of records. Selecting *clipboard* from the buttonbar provides a list of the earmarked records that can be saved to a file and which contain direct links to the original full records. We are keen to build feedback into the system and users can therefore add mini-reviews to records should they wish.

THE FUTURE

While progress has been made in Phase 2, much remains to be done, both in terms of improving content and making it more accessible. The latter includes incorporating global standards for descriptors as proposed by the Instructional Management System initiative[1] . More obvious refinements in the user interface will hopefully be made in consultation with users. Plans for a Phase 3 knowledgebase building on Phases 1 and 2 are also in preparation. We are particularly interested in providing a more community-oriented site and will use the Zope[2] system for this. We also envisage the use of Internet spiders to link non-LTSN data to the knowledgebase. Clearly development of the knowledgebase is an ongoing process.

We welcome feedback, ideas and content in helping make it a key resource for Bioscience teachers.

Dr Peter Miller is Knowledgebase Consultant at the LTSN Centre for Bioscience. He is also a lecturer and Director of the Honours School of Microbiology at the University of Liverpool. He was formerly Director of CTI Biology.

Dr Gayle Calverley is Online Services Manager at the LTSN Centre for Bioscience.

[1] http://www.imsproject.org/
[2] http://www.zope.org/
[1] http://www.imsproject.org/
[2] http://www.zope.org/

TEACHING SOFTWARE: WILL YOU BE USING A TLRP?

F E A T U R E

Recently, a number of projects developed through the Teaching and Learning Technology Programme (TLTP) have moved on from the development of new technology based materials for learning and teaching to a third phase; that of implementation, with the embedding of these technologies into higher education, and the evaluation of their effectiveness.

A number of these projects have produced software for teaching in disciplines in the Biosciences area, and this material is now available for use at low cost for UK teachers. In addition, several commercial suppliers have made teaching software available, although the ways in which such software can best be used in HE courses to achieve improve-ments in teaching and learning have not yet been fully established.

Providing such material for direct student access via a distributed network may seem like an easy route for hard-pressed lecturers, but this approach often produces disappointing results. This was shown when a piece of software was made available within the departmental software section of the student desktop. Initially, only 12% of the students on a module, most notably the more able of the students, used this facility. Demonstrating the software to students in a lecture increased utilisation to 65%. Unsurprisingly, telling the students the material was examinable increased utilisation to 84%, whilst setting an assessed task centred around the software increased utilisation to 96%. Although these figures relate only to one particular piece of software, a similar situation no doubt applies to other learning and teaching software packages.

However, access for students to such software is in itself insufficient. Placing such software in a pile on a distributed network may look impressive, but the exhortation to 'go and use it to learn' simply does not work. Our experience is that students only make use of such material if it is properly integrated within a module. A practical class is never presented as a lone facility; it is linked to concurrent lectures, it is assessed,

requires a write-up, utilises other skills and knowledge taught in the course and contributes to the achievement of stated learning objectives and the final mark awarded. Similarly, software should be integrated into a module. However, the production of the ideas and materials to achieve this is very time consuming. A shortage of time (along with the failure of institutions to properly reward innovative teaching) are among the barriers cited by pharmacology teachers to the utilisation of CAL in courses (Markham *et al.*, TIPS, 19, 257-265, 1998).

In response to these findings, an application was successfully made for TLTP funding for project 83 (Implementing technology based teaching and learning in Pharmacology). This project aims to help teachers utilise CAL by providing a Software Directory giving ready access to information about availability, utility and use of technology-based teaching materials; and providing complete Teaching and Learning Resource Packs (TLRPs) which enable specific pieces of software directed to particular teaching and learning objectives for a variety of different students to be implemented in courses with only minor time commitment from staff.

THE TLRPS

It is the development of necessary supporting material for technology-based teaching in HE courses that takes time, expertise and innovation from teachers. Examples of such material include the schedules setting out expected student objectives, the tasks the student is expected to accomplish using the software, the inclusion of help and advice in completing these, and schedules assessing the skills and learning gained. It is this material which forms a TLRP; effectively an editable wrap-around for a software package.

The tasks set in a TLRP are expected to be appropriate to the software package utilised and the learning objectives defined for a group of students. Thus answering or setting multiple choice questions, producing posters or delivering talks, providing summaries (perhaps web-based), providing answers to questions or working through

problem-based learning exercises may be involved and will be designed to be suitable for different types of student at different levels. Material to assess the learning gain will also be provided.

Seven TLRPs are available at present from the British Pharmacological Society with twenty planned in total.

These learning and teaching resource packs were produced by collaboration between discipline teachers and have proved highly effective in easing the task of integrating software into courses, providing new ideas and saving staff time. For example, a new (to the course) practical exercise and peer marking schedule for medical students was produced by staff in about 90 minutes utilising the pre-prepared material found in TRLP 2. The lecturer involved estimated that it would have taken them 2-3 days if the TLRP had not been available.

It is recognised however, that similar advantages can also be achieved if teachers are prepared to share the integrative material they have already produced with teachers who are about to or in the process of integrating the same software. We would like to encourage such collaboration between discipline teachers; part of the LTSN Centre for Bioscience's remit is to act as a repository for teaching materials, and also to act as a facilitator with respect to developing such networks. If you have developed new teaching materials and are in the position to share such materials with other teachers, we would be pleased to receive a copy for our Knowledgebase. If you are starting to develop such material, please look first on the LTSN Bioscience Knowledgebase, or contact us direct; somebody may already have developed something closely related to what you need which will make your job a lot easier.

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AUDIO VISUAL LIBRARY OF FOOD FACTORIES AND FOOD PROCESSING OPERATIONS

The successful projects in the latest phase of the FDTL (Fund for the Development of Teaching and Learning Programme) have recently been announced. Phase 3 of FDTL, funded by HEFCE and DHFETE, is the first of its kind to link quality assessment results to the allocation of funds to the higher education sector. The projects which are currently recruiting staff are expected to start in autumn 2000.

Gaining student access to factories is increasingly difficult as companies cut back on non-commercial activities, yet applied subjects such as Food Science require students to gain a feel for the scale of industrial processes and the relationship between different unit operations. This sense of scale is also pertinent in schools, where food technology is available at A-level and from where the next generation of food scientists and technologists will come.

Resulting from the Food Science subject review at Oxford Brookes University, a project was proposed to expand and disseminate an audio visual aid library of Food Processing videos. The bid was developed in conjunction with Leeds and Sheffield Hallam Universities, our three institutions forming a consortium to carry out the project.

Many food companies or equipment manufacturers have existing video footage intended to advertise their products, services and equipment and so we decided to make use of this material, rather than filming fresh footage. The idea of collating and editing existing footage into coherent teaching videos which illustrate the scale and size food processing operations seemed both viable and attractive. Some of the tapes were originally intended for either training or publicity, whilst others were promotional; the remaining tapes were amateur videos showing such things as new factory installations in operation. In their original format most of the videos collected are unsuitable for teaching or career advice, however, with careful editing they become a valuable teaching aid. Re-editing selections of video footage might produce a variety of films aimed at different audiences, *e.g.* career guidance videos *or* a teaching video which examines a particular unit operation.

It was envisaged that the broad outcomes from the project might be:

► Providing students with a real sense of scale with respect to industrial food operations.

► Familiarising students with technical aspects of unit operations and manufacturing processes, *e.g. unit operation* — audio visual aids showing the variety of equipment and the suitability of each to particular raw materials; and *manufacturing process* — audio visual aids that focus on particular products, investigating transformation from raw materials. While the unit operation visual aids would be directed mainly at the higher education sector, video material of manufacturing processes might also be of interest to secondary school students studying for the A-level in Food Science.

► The creation of a valuable resource for careers guidance in the form of audio visual aids and teachers' packs. A further intention of our project is to create two *career guidance packs* comprising a careers audio visual aid and a handbook.

Some people have asked why we chose to use video format rather than in vogue media such as interactive CD ROMS, DVD or the internet. This was because video recorders are more widely available in lecture/class rooms both in the UK and around the world, while personal computers are becoming widespread, to run video footage from a CD ROM or the internet actually requires a high specification machine with a large RAM, fast processor speed and enhanced graphics cards. Similarly, while embedding video footage into web pages is relatively easy, the set-up of the individual machine in terms of screen size (pixels) and colour options changes the appearance of the display substantially. Overall, a video tape format is far more versatile, enabling a wider spread dissemination. It is likely that as technology progresses, we will review this policy and will probably convert some of the material to DVD ROMs as an alternative format in the future. A web page which provides further information on this project along with a variety of related URLs can be found at www.brookes.ac.uk/FoodVidLib/. We do not want to re-invent the wheel and would like to hear from anyone who has ready made teaching material which could be added to the library so that it can be more widely spread to the food science teaching community.

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The full text of this article is available on http://bio.ltsn.ac.uk/

USING VIDEO TO ENHANCE THE DEVELOPMENT OF A VITAL MICROBIO-LOGICAL SKILL; ASEPTIC TECHNIQUE

Learning objective: To improve and practice aseptic technique.

Outline: Aseptic technique serves two main purposes: to prevent microbial contamination of the laboratory worker and to prevent contamination of the culture in use. The perfection of the technique requires practice coming from repetitive (and boring?) laboratory work. However, knowing what to do comes from explanation. The observation of good and bad technique is a useful tool to re-enforce the explanation. This case study looks at the use of video to encourage and maximise observation. *The students perform the manipulations but then they seek out, observe and record others performing the same techniques and then relive the experience of themselves and others, thereby re-enforcing the learning process.*

Description: In the first of three laboratory sessions demonstrating methods used in the analysis of a solid food material, the students are told they must video their fellow students performing aseptic work. The students work in pairs, operating the video or directing the filming. The video is replayed at the end of the session and aseptic technique together with laboratory practice, good and bad, is reviewed in group discussions.

Outcomes: The encouragement of interactivity by making the video rather than just viewing it has been shown to be a much more effective learning process. The students are able to assess their own lab skill development.

Assessment: No formal assessment is attached to this exercise — this puts the students at ease and allows them to perform the aseptic manipulations with as little stress as possible. However, once they have viewed the video they are encouraged to use a self-assessment table to grade their efforts.

Hints: A small, simple to operate video camera with a reliable battery is essential. The video player should have a slow motion feature: this encourages students to stop, reverse and slo-mo replay the action. Sound can often be a distraction and is best turned off.

This is a summary of one of nine case studies contained in a report entitled *Laboratory Work in Science Education: an Evaluation with Case Studies* by Les Jervis. The report was one of the outcomes of the programme for Science Education Enhancement and Development (SEED). SEED was based in the Science Faculty at the University of Plymouth and was funded by HEFCE's Fund for the Development of Teaching and Learning (FDTL). The overall aim of SEED was to document, develop and disseminate best practice in Science learning and teaching. SEED's outputs can be downloaded from *http://www.science.plym.ac.uk/departments/seed*

Dr. Graham Bradley, Department of Biological Sciences, University of Plymouth

LTSN CENTRE FOR BIOSCIENCE TEACHING DEVELOPMENT GRANTS

The LTSN Centre for Bioscience is pleased to announce the availability of grants of up to £1000 (or exceptionally £2000) to encourage the development, establishment or validation of innovative teaching materials or methods.

Applications will be assessed against the following criteria:

► establishment of a case demonstrating a need for the development within the Bioscience community;

► the likelihood that the development will successfully meet that need;

► the deliverability of the development within 12 months of the agreed starting date;

► the applicability of the development across the area of Bioscience;

► a clear deliverable timetable with milestones, start date and budget (including VAT where appropriate; departmental or institutional overheads will not be paid); and

► agreement to relinquish copyright on any original material so it may be freely distributed to UK HE and FE.

There is no specific format for application but the following guidelines should be adhered to. Applications on up to 2 sides of A4 (11 point) are invited by 21 January 2001 and should be sent to the LTSN Centre for Bioscience, School of Biochemistry and Molecular Biology, University of Leeds, Leeds LS2 9JT marked on the envelope GRANT APPLICATION. Each application should give the TITLE of the project, the institutional ADDRESS, the NAME of the project leader and any team members, and the address and contact numbers (including e-mail). Applications must be submitted with departmental/school support. The rest of the application should clearly address each of the assessment criteria set out above.

The grant is cash limited, can be used for anything necessary for the completion of the project, will be subject to the submission of satisfactory 3 month progress reports and will be administered through the local institution's financial arrangements.

Applicants will be notified individually of the outcome by 1 March 2001.

CURRICULUM 2000 – ARE YOU READY FOR THE REALITY?

There can be few people who have not heard of the A-level changes that have hit the UK education system this September. Curriculum 2000 is the biggest shake-up in post-16 education since the 1950s, and is now a reality, affecting students, parents, secondary level and HE teachers.

Previously, the step from GCSE to A-levels has been regarded as the most difficult jump in a students academic career. Curriculum 2000 aims to negotiate this jump in a different way, splitting advancement up into bite-sized pieces. Over the two years of 16-18 education, the student will do AS (*advanced subsidiary*) levels in the first year. These will be of a standard half-way between the present GCSEs and A-level, i.e. well below current A-level standard. It is thought that the majority of students will be likely to take 4 AS subjects (possibly 5) in the first year of study and then be examined and receive a certificate. They will then continue with three A2 subjects in the second year. Unfortunately, the attempts at easing the student through the jump from GCSE to A-levels may merely have shifted the educational leap. This means that potentially the old problem will rear its head between the lower and upper sixth forms, rather than year 11 and the lower sixth.

It is believed that changes to the A-level system are necessary because as previously stated, the jump from GCSE to A-level standard has been found to be very demanding for students. As a result of this, only a relatively small proportion of students actually take A-levels, despite the educational system and public in general regarding them as academic in attainment and appropriate for the vast majority of students. Taking more subjects in the first year is aimed at providing a broadening of the experience for students: a new vocational A-level will be offered alongside traditional A-levels; a 'key skills' course designed to improve employability will also be available, and soon there will be 'Advanced Extension Awards' for the very brightest students. The curriculum has been developed so that AS subjects contain the less demanding and non-quantitative aspects of current A-level syllabuses, with good students gaining A grades. The subjects will be divided into 8 or 9 modules although at some stage there will be some synoptic papers taken from all modules. It is expected that these will not involve much recall of information.

The UCAS tariff has also altered to cope with these changes, with points given for grades in the new vocational qualifications. So far, traditional universities appear to be ignoring these qualifications: whilst taking such qualifications into account, they are still insisting on three good A-levels.

The Key Skills training is aimed at all students, and will be taken in addition to the core content. This course will include IT, Communications and application of numeracy skills. Students will also be required to produce a portfolio of their achievements. Attainment will be assessed and recorded separately on a single certificate for students achieving a certain level in all three aspects. The approach is designed to encourage all students studying A-levels to exploit opportunities to develop key skills in the context of their studies. Hence many schools/colleges will not be addressing skills separately. Where their studies do not generate all the evidence needed for key skills certification, evidence from other studies will be required. Students will be better trained in a number of areas, but it is likely that they will have less factual knowledge of the subject matter.

It is important that University Departments are aware of these changes: they may need to modify their courses and/or entry requirements accordingly, changing to a more flexible admissions policy. Learning and teaching policies may also have to be reviewed, taking into account the possible presence of students with less background knowledge of the specific subjects they have chosen to study. There is a worry that HE Institutions will respond too slowly, resulting in problems further down the line. However, such a major change in education will take a while to settle down; HE teachers are advised to keep an eye on developments. LTSN Bioscience will keep you updated, and if you have any queries, please contact us.

SHOTLIST VIDEOS FOR TEACHING

The relationship between bio-chemical cause and clinical effect is at the heart of medicine, especially so as the secrets of biochemistry and genetics increasingly explain disease.

Over the last few years the Educational Broadcasting Services Trust (*EBS Trust*) has been producing video programmes to help in the teaching of pre-clinical medical students and other undergraduates reading Biological subjects. The *Shotlist* series was devised by a consortium of 17 universities and seeks to provide academic staff with moving pictures which they can use to show and explain things to students. Staff in these universities have co-operated with TV producers to produce high quality videos on a range of topics. The pre-clinical medical programmes are examples but there is a range of other titles too (see the website: www.shotlist.co.uk).

So far in the medical series the following programmes have been produced: diabetes, phenylketonuria, cystic fibrosis, and galactosaemia, and more are planned (on sickle cell anaemia and *Continued on back cover*

WHO'S WHO IN THE LTSN CENTRE FOR BIOSCIENCE?

The aim of the Centre for Bioscience is to support practitioners in higher education. We therefore welcome your comments on all aspects of the Centre's work and the major issues in biosciences education. Your experiences, solutions to problems and ideas for the development of the LTSN Bioscience Centre are essential and we look forward to receiving your input and views. Let us know about your views on your areas of expertise and how you would like to contribute to the work of the Centre.

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Top, from left to right: Ed Wood, Yolande Knight, Trish Walker, Heather Sears and Ian Hughes; left: Peter Miller and Gayle Calverley; and right: Simon Heath.

Subject Specialists

Dr Simon Heath
Agriculture, Animal science and Management, Aquaculture and Management, Crop and Grassland Science and Management, Forestry, Horticulture, Soil Science and Management, Food Science and Technology.

Dr Yolande Knight
Bioinformatics, Cellular and Molecular Biology, Botany, Genetics, Pharmacology.

Dr Heather Sears
Anatomy and Physiology, Biochemistry, Ecology, Microbiology, Systematics, Zoology.

mechanism. Most university lecture theatres now have built-in video players, so you can just go along with your cassette and push it in at the appropriate moment. In the future such video clips will surely become commonplace on the Web or on CD-ROMs etc.

The guiding light behind *Shotlist* is Jim Stevenson, a one-time biochemist and more recently BBC Open University film producer and finally BBC Head of Programmes at the OU. In a recent article in *The Biochemist* (the house magazine of the Biochemical Society, June 2000 issue, p.31) he wrote: *"Well-made moving pictures accelerate learning and a bran tub of well-thumbed electronic materials does increasingly provide for that variety of learning styles which increasingly characterize higher education teaching and learning".* You can find out more from the website or from: *mail@ebstrust.u-net.com.*

glucose 6-phosphate dehydrogenase deficiency). Each of these videos comes in four approximately 5-minute sections entitled: presentation, diagnosis, treatment and biochemical basis. In the first section we see the patient explaining his or her symptoms, in the second the methods of diagnosis are shown, in the third the treatment is explained, and the final section deals with the biochemistry of the disease. Each section could be used alone in a lecture or given to students to view in their own time. There are also short videos available on cell culture, immunoblotting, monoclonal antibodies, and membrane structure and transport.

More importantly however, to purchasers of the programmes are copyright free may be copied or edited to fit the particular teaching need. This is crucial because lecturers will often say that there are excellent videos on a given topic, but they are not quite right for the course that they are giving or that they are too long: only certain bits are useful to them, and copyright considerations make editing well nigh impossible to get the bits they *do* want to show in a lecture. We can think of the video clip as an animated slide, only a minute or two long to emphasize a point, show a real patient, show some equipment or a diagnostic method or an animation of some biochemical