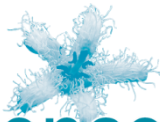


OeRBITAL

**Enhancing the student learning experience
through the use of open educational resources**

Terry McAndrew, Chris Taylor, Carol Wakeford, Peter Klappa,
Dave Lewis





Have you ever used free, online, open access,
educational resources?

- 1 = Never
- 2 = Occasionally
- 3 = Regularly
- 4 = A lot
- 5 = An awful lot



Do you know what open educational resources and reusable learning objects are?

1 = Definitely not

2 = Not really

3 = Unsure

4 = I think so

5 = Definitely yes





New initiatives to improve the production and development of sharable learning and teaching materials

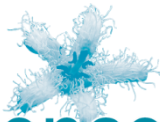


Creative Commons and Open Content

- Licence models to encourage sharing without fear and proper attribution
- Open Educational Resources
 - What's different about the OER approach?
 - OER Phase 1 and 2 (3 to follow)



**Open
Educational
Resources**

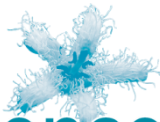


Sharing learning and teaching resources **could be more effective** than it currently is, to improve the student learning experience

True

False

No idea

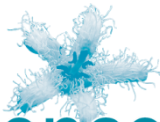


Competition between institutions (in the same disciplines) **will be more effective than collaboration** to improve the overall student learning experience

True

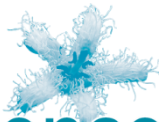
False

No Idea



So how can we improve the discovery and use of Open Educational resources in the biosciences?

- Task agents to do some discovery
- Evaluate supporting networks and mechanisms
- Make stronger links with the learned societies
- Share stories of how effective the supporting projects have been
- Find resources worth ‘boosting’ to gain supporters and enhancements
- Bridge into other appropriate professional groups



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Main Page

OeRBITAL Project Wiki

Welcome to the OeRBITAL project Wiki. This will be the area used to gather Open Educational Resources in the Biosciences during the project and disseminate information about them (and our experiences too).

This projects seeks to discover key OER in a number of disciplines and identify steps to promote them into sustainable re-use, boosted by contributions from members of the relevant community. To discover more about the project, see the 'About OeRBital' link at the foot of any page.

Contents [hide]

- 1 The Discipline Consultants
- 2 The Learning Technologists
- 3 The Project Team
- 4 Suggestion Box

The Discipline Consultants

The following members of the Bioscience community have agreed to work on the project. Principle areas are in bold.

Name	Institution	Disciplines
Jenny Koenig	Cambridge	Maths in BioMaths , Pharmacology, Molecular neuroscience, physiology and biochemistry
Momna Hejmadi		
Peter Klappa		
Richard Stafford		
Alan Cann		
Christopher Todd		
Clare Sansom		
Dave Lewis		
Gordon Cooper		
Carol Wakeford		

The Learning Technologists

- Karen Allan
- Julian Priddle
- Vivien Sieber

The Project Team

- Terry McAndrew
- Chris Taylor

Suggestion Box

The project is using Suggestion Box for

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MediaWiki based project Wiki

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Pharmacology

Pharmacology OERs have been organised into the following themes:

- Autonomic Pharmacology
- Cardiovascular Pharmacology
- Clinical Pharmacology and Therapeutics
- Drug development
- Experimental preparations and techniques
- Pharmacogenomics
- Pharmacological principles
- Pharmacology podcasts

Where OERs contain resources which span more than one theme, the main OER can be found at:

- Pharmacology multi-themed resources

Learned Society educational resources:

- British Pharmacological Society
- International Union of Basic and Clinical Pharmacology (IUPHAR)

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Experimental preparations and techniques

Contents [hide]

- 1 Pharmacological Lab Procedures
- 2 Practical Animal Handling
- 3 Procedures with Care
- 4 Zebrafish in the Classroom

Pharmacological Lab Procedures

Pharmacological Lab Procedures comprises of short videos covering the setting up of a frog heart preparation, investigations into the autonomic effects of muscarinic agonists in rats in-vivo, the respiratory depressant effects of morphine or pentobarbitone in rabbits and strychnine poisoning in Toads. The clips themselves may be useful in illustrating the actions of specific pharmacological agents in-vivo however there is no accompanying practical or problem-based learning exercises or notes. The equipment utilised is also dated.

There are also ethical concerns, given that these clips illustrate in-vivo experimental preparations, there is no material covering how animals were culled, appropriate choice and use of anaesthetics etc.

These resources were produced by the Department of Pharmacology, Kwame Nkrumah University of Science and technology, Ghana and form part of the African Health OER Network [1]. All materials are licensed under a creative commons attribution licence

Practical Animal Handling

Practical animal handling is an online tutorial guide to best practice in the handling and restraint of eight common species of research animals, covering both young and old animals. It comprises of short videos, images and supporting text. The aim being to demonstrate best practice so as to minimise pain, suffering in distress in the research animal.

These resources have been produced by the British Veterinary Association Animal Welfare Foundation. There are no details of licences

This resource is suitable for undergraduate and postgraduate training and for staff CPD.

Procedures with Care

Procedures with care is a collection of 8 videos demonstrating best practice in administration of substances to laboratory rats and mice by subcutaneous, intramuscular, intraperitoneal and intravenous injection. The resources are designed to provide training so that individuals develop the manual skills needed to carry out the different procedures humanely and efficiently whilst minimising pain or distress to the research animal. Each video can be viewed online or downloaded as a trainer pack which includes the videos and accompanying photographs. Training videos of other species of research animals will be added in due course.

The site also has links to the Digital Resources For Trainers (DReTs) website which contains 18 CD's of images and short videos covering all aspects of research animal welfare, husbandry, and the induction and maintenance of anaesthesia. This CD's are available for a small charge

Procedures with care has been produced by the highly respected Newcastle University group in partnership with the Institute of Animal Technicians and the National Centre for the 3Rs. Copyright is retained by the developers

This resource is suitable for undergraduate and postgraduate training and for staff CPD.

Zebrafish in the Classroom

Zebrafish in the Classroom is designed to be a resource for teachers and students who are using zebrafish in undergraduate courses. It is an excellent site which contains virtually all you need to know in order to use zebrafish in teaching from protocols to breed and maintain them, experiments students can undertake in live zebrafish to data/images for use in virtual experiments, tutorials and videos. The site also contains many supplementary resources including a glossary of zebrafish-related terminology and links to the Zebrafish Information Network (ZFIN) which has a wealth of additional information about the zebrafish as model system.

This resource was developed by Dr. Jennifer Liang and colleagues from Case Western Reserve University and University of Minnesota-Duluth. All resources are licensed under a Creative Commons Attribution 3.0 Unported Licence.

It is suitable for undergraduate Level 4 and upwards. It can also be used as a useful information source for individuals who utilise zebrafish in their research

navigation

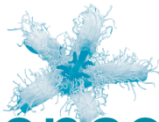
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ZFIC

Zebrafish in the Classroom

banner

Welcome!!!

Zebrafish in the Classroom is designed to be a resource for teachers and students who are using zebrafish in undergraduate courses.

The same characteristics that make zebrafish a powerful system for basic research also make them an excellent tool for teaching: embryos are easy to obtain in large numbers, development can be observed live in fish using simple dissecting microscopes, and mutants can be used to demonstrate principles of development and genetics.

This website was generated by Dr. Jennifer Liang, a dedicated and creative team of undergraduate students, and generous collaborators. On this site you can find protocols for many [common techniques](#) such as raising zebrafish, producing embryos, and detecting mRNAs and proteins, [classroom experiments](#) that students can do with live zebrafish, and [virtual experiments](#) that students can do using data and images we provide.

We have also created many other resources that we anticipate will be useful for students and teachers alike, such as [games](#) that will help you learn about zebrafish and a [glossary](#) of field-specific terms. Finally, there is a link to the [Zebrafish Information Network \(ZFIN\)](#) which has a wealth of additional information about the zebrafish model system.

This site is still growing and changing as we add more features and learn more about web design. We hope that you will visit us frequently to see what is new, and [contact us](#) if you would like to make suggestions or contribute to the site.



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ZFIC

Zebrafish in the Classroom



Virtual Experiments

This section of the website is designed to enable you experiments without the use of an actual laboratory. Not all educational facilities have the resources to have zebrafish labs available for experimentation. As such, aim is to provide an avenue for interactive learning through virtual experiments. The incentive behind these virtual experiments is to give students a better understanding of developmental biology and at the same time demonstrate the scientific method.

All of the experiments here will be outlined in such a way that follows the scientific procedure, for example developing, testing, and supporting/disproving a hypothesis.

[*casanova Mutation Experiment*](#)

The *casanova* virtual experiment can be used to learn the effects of genetic mutations to and the properties of heart formation in zebrafish.

[*Developmental Staging Experiment*](#)

The *Developmental Staging* experiment illustrates the temporal and spatial growth of a zebrafish embryo.

At the beginning of each experiment there will be a brief introduction on the material to be covered in the experiment. There will also be a link to a PDF version of the experimental protocol, as well as links to the various techniques used to carry out the experiment.

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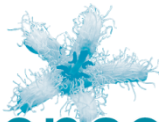
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Clinical Pharmacology and Therapeutics

Interactive Clinical Pharmacology

[Interactive Clinical Pharmacology](#) comprises of 16 interactive Flash presentations designed to increase understanding of important and sometimes difficult concepts and principles in Clinical Pharmacology eg pharmacodynamics, pharmacokinetics. It is not intended to be comprehensive for all aspects of Clinical Pharmacology teaching. The resource is suitable for both undergraduate and post-graduate students in medicine, pharmacy and pharmacology. It was developed by Clinical Pharmacologists at Christchurch Hospital / University of Otago Christchurch, New Zealand. The resource is free for personal use. Anyone wishing to use the site, or any part thereof, for commercial, educational or other non-personal use must gain permission from the developers.

Pharmacology Problem Sets

[Pharmacology problem sets](#) are a collection of 6 clinical pharmacology and therapeutics problem solving exercises covering, for example, the autonomic nervous system, general anaesthetics and pharmacological emergencies. Each comprises of an introduction to the topics, data followed by questions on this material. Following completion of the exercise, online feedback is provided; there is also a link to an online glossary of pharmacological terms. The resource was designed as a self-directed learning resource to supplement other teaching by colleagues at the Boston School of Medicine, Pharmacology and Experimental Therapeutics. There is no information regarding IP, licencing or use of this resource

Prescribe

[Prescribe](#) is currently under development. The intention is that this OER will be a repository of e-learning materials covering pharmacology, clinical pharmacology and therapeutics. It will include information in the above areas, interactive materials including those that provide the opportunity to develop/practice key skills such as dose calculations and prescribing, and links to other resources.

Prescribe is being developed by the British Pharmacological Society in collaboration with the Department of Health's e-Learning for Healthcare (e-LfH). It is designed to supplement other methods of teaching and is targeted at Medical Students and other healthcare professions. It will be available free of charge to students registered with UK universities and NHS-affiliated organisations.

[Return to Pharmacology main page](#)

Know of a good OER? Share it with colleagues via the [Suggestion Box](#)



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Interactive Clinical Pharmacology

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Tutorials



Drug Clearance

The most important pharmacokinetic parameter. Determines maintenance dose.



Drug Elimination

Drug clearance and dose requirements vary markedly throughout life.



Volume of Distribution

The volume into which a drug appears to be distributed. Determines loading dose.



The Half-life

The time for the concentration of the drug to halve.



Dosing Variations

The route of drug administration influences pharmacokinetics.



Oral Availability

The fraction of drug that reaches the systemic circulation after oral ingestion.



Pharmacodynamics

The action of the drug on the body.



Pharmacogenetics

How genes determine drug concentrations.



Saturable Drug Metabolism

When drug concentrations exceed the capacity of metabolism.



Protein Binding

Only important in interpreting measured drug concentrations.



PH and Pharmacokinetics

Acids are ionized in basic media.
Bases are ionized in acidic media.



Dosing and Age

Drug clearance and dose requirements vary markedly throughout life.



Drugs in Pregnancy

Effect of drugs on the pregnancy.
Effect of pregnancy on the drugs.



Drug Interactions

How one drug affects the concentrations or actions of another.



Drug Transport

Active transporters can help prevent some drug toxicities and aid uptake of some drugs.



Graph Plotter

Vary your dose regimen for different clinical settings.

Feedback



We welcome your feedback and questions here.

Keep this website alive!

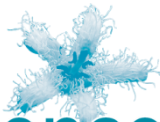
...continuing to remain available, and for development. Donations are encouraged, particularly from institutions that might be using the site in courses (which we strongly support).

Donate



Download the latest Adobe Flash Player





Interactive Clinical pharmacology

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Drug Clearance

Cylinder Model

The relation between dose rate, drug clearance and plasma concentration is illustrated by the cylinder model.

Dose rate is represented by tap flow, drug clearance by outlet size, and plasma concentration by the height of the water column.

Adjust the tap flow, and the size of the outlet to see what happens to the height of the water column.

Module 1 of 4

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Module 1 of 4

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Drug Clearance

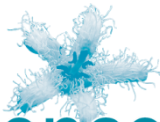
Cylinder Model

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Adjust the tap flow, and the size of the outlet to see what happens to the height of the water column.

Module 1 of 4



Discuss, with the people around you, the arguments for and against the use of online, open access educational resources

This side of the room

Arguments **FOR** their use
(explain how OER and Open
Content
can really work

for institution, staff and students)

This side of the room

Arguments **AGAINST** their use
(identify real barriers to OER and
Open Content development and
use)

Ask questions openly; record decisions on post-it



After today's workshop, I

- 1 = am still not going to use OERs
- 2 = will decrease my current usage of OERs
- 3 = will start to use OERs
- 4 = will increase further my current usage of OERs
- 5 = will continue with my already extensive use of OERs

Any questions?

OeRBITAL Wiki: <http://hebiowiki.leeds.ac.uk/oerbital/>

OeRBITAL Project: <http://www.bioscience.heacademy.ac.uk/resources/oer/>

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Chris Taylor (Project Officer): c.d.taylor@leeds.ac.uk