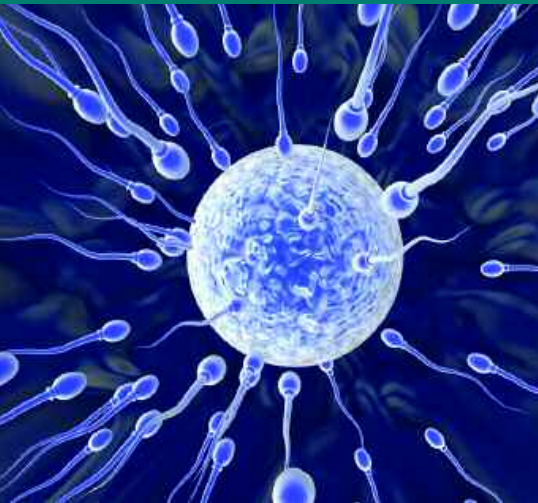


Internet resources for
**genetics and
evolution**



Welcome to

Internet resources for genetics and evolution

This booklet gives a sample of the online resources you can find using **Intute** – a free Internet service designed to help students, lecturers and researchers find the best of the Web for their education and research.

Intute is created by university subject specialists, and offers over 130,000 links to academic content on the Web, as well as a suite of Internet training tutorials.

Lecturers can use **Intute** to guide their students to websites that are relevant to their courses, and help them develop Internet research skills for university work.

If you like what you find in this booklet please visit our website, where you can access many more scholarly Internet resources:

Intute: Health & Life Sciences

www.intute.ac.uk/healthandlifesciences/

Or try these online tutorials designed to help students develop their Internet research skills:

Internet: Virtual Training Suite

www.vts.intute.ac.uk/

Your guide for this booklet is:

intute : health & life sciences

based at the University of Nottingham



Intute is a JISC service developed in collaboration with staff from universities, colleges and research institutions across the UK, pooling expertise to share nationally.

There is an enormous amount of material about genetics and evolution available on the Internet, but of variable quality. This selection of evaluated resources has been organised under different headings to demonstrate the wide variety of types of material available. Whilst most of the sites chosen are specific to the subject, at the beginning of each section we have included a few of the many broader biological sciences resources that include genetics and evolution.

Learning and teaching materials online

Some of these are designed to complement university lectures, whereas others are the outcome of museum exhibitions or television programmes.

Understanding Evolution

<http://evolution.berkeley.edu/>

This site includes a series of tutorials and is designed to provide teachers with all the resources they need to both understand and teach the topic of evolution.

Plant Evolution Timeline

<http://www.ensemble.ac.uk/projects/plantsci/timeline/>

This tool, designed to aid plant scientists at the University of Cambridge, allows the user to include or exclude specific data sets (such as Tectonic activity or Speciation) to the timeline. It is designed to work with Firefox and may not perform properly on other browsers.

GENETICS: Analysis of Genes and Genomes

<http://www.jbpub.com/genetics/6e/>

Designed for students reading the book Genetics: Analysis of Genes and Genomes, Sixth Edition, the website features exercises and links to help broaden understanding of genetic principles.

Fossil Horses in Cyberspace

<http://www.flmnh.ufl.edu/natsci/vertpaleo/fhc/fhc.htm>

Illustrations and text compare horses with other ungulates and demonstrate hoof evolution.

University of Paisley: Biomedica Museum

<http://www-biol.paisley.ac.uk/biomedica/>

Taking a tour through a virtual zoology museum, these pages provide an extensive guide to the anatomy, morphology and evolution of the major taxonomic groups.

Bone Diggers: Australian Fossils of Extinct Giant Animals

<http://www.pbs.org/wgbh/nova/bonediggers/>

Produced by PBS (US) to accompany a television programme, this resource includes videos and interactive sections as well as detailed text about the evolution and extinction of Australian species.

Genie (Genetics Education Networking for Innovation and Excellence)

<http://www.le.ac.uk/genetics/genie/>

Located at the University of Leicester, GENIE is a Centre of Excellence in Teaching and Learning and takes a national lead in developing innovative approaches to genetics education.

Basic Principles of Genetics: an Introduction to Mendelian Genetics

<http://anthro.palomar.edu/mendel/default.htm>

A resource containing three tutorials covering Mendel's genetics, probability of inheritance, and exceptions to simple inheritance.

Genomics Analogy Model for Educators (GAME)

<http://www.entm.purdue.edu/extensiongenomics/GAME/>

A tool containing simple analogies to explain the general ideas behind genomics. A basic lesson introduces genetics and alleles, and a further four lessons cover the basics of genomics, biotechnology, and gene sequencing.

Genes and Cells That Determine the Lifespan of *C. elegans*

<http://www.ascb.org/ibioseminars/kenyon/kenyon1.cfm>

One of a series of freely available seminars published by the American Society for Cell Biology, this video lecture deals with genes and cells affecting the lifespan of *C. elegans* and their effects on the aging process.

Early Theories of Evolution

<http://anthro.palomar.edu/evolve/>

This site presents discoveries of the 17th – 19th centuries which led to the acceptance of biological evolution, and introduces the views and thoughts of pre-Darwinian figures before discussing the theory of natural selection.

A History of Evolutionary Thought

[http://www.ucmp.berkeley.edu/](http://www.ucmp.berkeley.edu/history/evothought.html)

[history/evothought.html](http://www.ucmp.berkeley.edu/history/evothought.html)

Part of the website of the Museum of Paleontology at the University of California, this provides an overview of the development of the theory of evolution through a chronologically arranged list of thinkers and scientists who played prominent roles.

Darwin

<http://www.fieldmuseum.org/darwin/>

Online version of an exhibition at the Field Museum, Chicago in 2007/8, giving a biography of Darwin as well as a synopsis of his work, with links to related research being carried out at the Museum.



Databases (bibliographic)

Databases of literature are usually searchable in a variety of ways and may provide access simply to the details of a document, or to an abstract, or to the full text.

BIOSIS Previews

http://www.thomsonreuters.com/products_services/scientific/BIOSIS_Previews

The electronic version of Biological Abstracts and Biological Abstracts/RRM, this database includes abstracts from thousands of life science journals, international meetings and books, and goes back to 1926. It is accessible only via subscription.

Zoological Record

http://www.thomsonreuters.com/products_services/scientific/Zoological_Record

The world's oldest continuing database of animal biology with coverage back to 1864, Zoological Record has long acted as the unofficial register of animal names.

EPConDB: a Resource of the Beta Cell Biology Consortium

<http://www.cbil.upenn.edu/EPConDB/>

Aimed at researchers, this database contains information on genes expressed in pancreatic cells and their transcriptional regulation.

Online Mendelian Inheritance in Animals: OMIA

<http://omia.angis.org.au/>

A database of inherited traits or defects that have been documented in a wide range of animal species other than those for which databases already exist. Made available on the Web by the Australian National Genomic Information Service.

Bibliography of Genetic Variation in Natural Populations

<http://www.lib.umt.edu/guide/allendorf.htm>

Over 80,000 references relating to the study of genetic variation in natural populations of animals, plants and microbes, with an emphasis on fish.

Bibliography of Systematic Mycology

<http://www.indexfungorum.org/BSM/bsm.htm>

This bibliography provides a survey of literature covering the biodiversity, classification, distribution, evolution, identification, nomenclature, phylogeny, systematics and taxonomy of fungi.

The Complete Work of Charles Darwin Online

<http://darwin-online.org.uk/>

This site covers Darwin's published writings and unpublished papers (though not his correspondence) and also has a biographical section and a selection of images. Much of the material is from the Cambridge University Library.

Databases (non-bibliographic)

Instead of documents, non-bibliographical databases may list specimens held in a collection, statistical information, or images.

ARKive

<http://www.arkive.org/>

Films, photographs, and audio recordings of the world's species and habitats.

Dendrome: a Forest Tree Genome Database

<http://dendrome.ucdavis.edu/>

A collection of resources, including the primary genome database TreeGenes, which is aimed at the forest genetics community. Published by the University of California at Davis.

Seed Information Database

<http://data.kew.org/sid/>

The result of a project to collect seeds from up to 25,000 species, the Seed Information Database is searched by scientific name and each record provides details of storage behaviour, seed weights, seed dispersal, germination, oil content, and viability constants.

Biodegradative Strain Database

<http://bsd.cme.msu.edu/>

This database aims to consolidate strain-level microbial data to establish the phylogenetic distribution of biodegrading organisms and to gain insights into the evolution of the degradative processes.

Global Population Dynamics Database

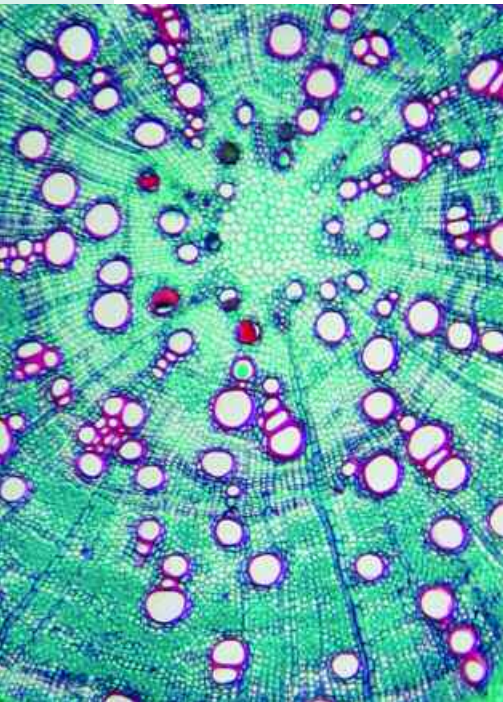
<http://www3.imperial.ac.uk/cpb/research/patternsandprocesses/gpdd>

The NERC Centre for Population Biology site offers the largest collection of animal and plant population data in the world. The service is offered free but researchers are asked to register.

Palaeontological Database of Rudist Bivalves (Mollusca: Hippuritoidea, Gray 1848)

<http://www.ruhr-uni-bochum.de/sediment/rudinet/intro.htm>

An introduction to the palaeontology of this extinct group of rudist bivalves, including descriptions of their evolution, morphology and palaeoecology.



Electronic journals and full-text resources

Very often journals offer only abstracts freely and charge for access to full-text. However, there are an increasing number of journals and repositories which make the full-text of papers freely available, and also websites which publish out-of-copyright books.

Proceedings of the Royal Society B: Biological Sciences

<http://publishing.royalsociety.org/index.cfm?page=1569>

Dedicated to the rapid publication and broad dissemination of high-quality research papers, reviews and comments, this journal is especially strong in organismal biology. Access requires subscription but some review articles are free.

PLoS Biology

<http://biology.plosjournals.org/>

An open-access, peer-reviewed biology journal. New articles are published online weekly, issues published monthly, with full-text available online or for download.

Genome Biology

<http://genomebiology.com>

An open access journal, started in 2000 by BioMed Central, publishing original, peer reviewed research on all aspects of genomic biology at the molecular, cellular, organism and population levels.

DNA and Molecular Genetics

<http://www.emc.maricopa.edu/faculty/farabee/BIOBK/BioBookDNAMOLGEN.html>

Part of an On-Line Biology Book, this chapter covers the structure of DNA and its replication. Other chapters cover different aspects of genetics and evolution.

Teaching About Evolution and the Nature of Science

http://books.nap.edu/catalog.php?record_id=5787#toc

Produced by the Working Group on Teaching Evolution at the National Academy of Sciences in the US, this book provides an overview of the evolutionary process and summarises the scientific evidence for evolutionary theory.

Science, Evolution, and Creationism

http://books.nap.edu/catalog.php?record_id=11876

This book, published in 2008 by the US National Academy of Sciences and the Institute of Medicine, aims to give “a comprehensive and up-to-date picture of the current scientific understanding of evolution and its importance in the science classroom”.

Open Evolution Journal

<http://www.bentham.org/open/toevolj/>

An open access peer-reviewed journal begun in 2007 and made available through the Bentham Open initiative. It publishes original research, letters and review articles in all areas of evolutionary biology and ecology.

Journal of Zoological Systematic and Evolutionary Research

<http://www3.interscience.wiley.com/journal/118496893/home>

A journal publishing material on evolutionary research within the fields of zoological systematics and phylogeny. Full-text is available to subscribers only.

Evolution and Development

<http://www3.interscience.wiley.com/journal/118546131/home>

Started in 1999 and sponsored by the Society for Integrative and Comparative Biology, this journal publishes original material at the forefront of evolutionary science and developmental biology. Contents and abstracts are available free.

On the Origin of Species / Darwin, Charles

<http://www.literature.org/authors/darwin-charles/the-origin-of-species/>

Provided free by Literature.org this full text version of "On the Origin of Species" can be browsed by chapter.

Darwiniana/ Collection of Essays by T. H. Huxley

<http://aleph0.clarku.edu/huxley/CE2/index.html>

This site provides access to Huxley's essays on the publication of Darwin's "Origin of Species" and the subsequent debate on evolution.

Life and Letters of Charles Darwin: Volume 1

<http://www.gutenberg.org/etext/2087>

The full-text of this volume which includes an autobiographical chapter (London, John Murray, 1887) is made available by Project Gutenberg who aim to make out-of-copyright texts freely available on the Internet.

News and mailing lists

A quick way of ensuring that you are aware of recent advances or debate in a particular field is to join a relevant mailing list or subscribe to a news service.

JISCMail: Ecological-Genetics

<http://www.jiscmail.ac.uk/cgi-bin/webadmin?A0=ecological-genetics>

Set up to enable researchers in ecological genetics to maintain contact between annual meetings of the Ecological Genetics Group, and to discuss ideas, problems and results.

Guardian: Genetics

<http://www.guardian.co.uk/science/genetics>

A section of the Guardian newspaper website which provides up-to-date information on topical issues in science, the environment, medicine and technology. It is updated daily and arranged chronologically.

Molecular-Evolution/bionet.molbio.evolution Archives

<http://www.bio.net/hypermil/mol-evol/>

A newsgroup for scientists studying how DNA, RNA, proteins and organisms have evolved at a molecular level, made available by the Department of Biology at Indiana University.

Yeast Archives

<http://www.bio.net/hypermil/yeast/>

A moderated BIOSCI newsgroup for discussion of the molecular biology and genetics of yeast.

Evolution Research News

<http://www.evolutionresearchnews.org/>

A research tool covering all aspects of evolutionary biology as well as Darwinism, Creationism, Intelligent Design, and associated controversies.

ScienceDaily: Fossils and Ruins News

http://www.sciencedaily.com/news/fossils_ruins/

Reports on the latest stories relating to anthropology, evolution, palaeontology, palaeogeography, and palaeoclimatology.

Evolution on the Front Line/ American Association for the Advancement of Science

http://www.aaas.org/news/press_room/evolution/

This page gives access to news items about evolution, focussing on the evolution/creationism debate, as well as to a selection of more in-depth pieces on evolution, in an attempt to support the teaching of evolution in public schools.



Portals and resource guides

These large and complex sites are often provided by publishers or major institutions but sometimes simply by an enthusiast in a particular field.

National Biological Information Infrastructure (NBII)

<http://www.nbi.gov/portal/server.pt>

Led by the US Geological Survey, this is a network of biological data and information sources, provided through the collaboration of federal, state and local government agencies as well as non-government institutions.

Genetics Virtual Library

http://www.ornl.gov/sci/techresources/Human_Genome/genetics.shtml

This virtual library provides links to resources on genetics and includes a wide range of organisms including human, mouse, sheep, bacteria, and plants. The site can be browsed by Organism, Topic or by Human Genome Project.

Gene Gateway: Exploring Genes and Genetic Disorders

http://www.ornl.gov/sci/techresources/Human_Genome/posters/chromosome/

This site provides guides and tutorials to help students to use the information produced by the Human Genome Project, and introduces Internet tools for investigating genetic disorders, chromosomes, genome maps, genes, sequence data, genetic variants, and molecular structures.

BioMed Central: RNAi Gateway

<http://www.biomedcentral.com/gateways/rnai/>

One of a series of subject gateways bringing together collections of content and resources from the journals and sites published by BioMed Central.

Evolution Research News

<http://www.evolutionresearchnews.org/>

A research tool for biologists, students and teachers covering natural selection, origin of life, phylogenetics, and all other aspects of evolutionary biology, as well as Darwinism, Creationism, Intelligent Design, and associated controversies.

Evolutionary Theory

<http://cogweb.ucla.edu/ep/Evolution.html>

A detailed essay introducing contemporary evolutionary theory, providing references to published works. Part of a collection of articles on the University of California website.

Alfred Russel Wallace Page

<http://www.wku.edu/~smithch/index1.htm>

Resources available from this site include a chronology of the main events of Wallace's life, quotes from his writings, an extensive bibliography of his publications, and a selected bibliography of writings about him.

Darwin 2009 Houston

<http://www.darwin2009houston.org/>

A site produced by a group of American institutions working together to offer events and resources based on the bicentennial of Darwin's birth and the sesquicentennial of the publication of *On the Origin of Species*.

Societies and professional associations

Whilst the websites of some professional associations and societies concentrate on details of their structure and membership conditions, others also include details of publications and research.

Institute of Biology

<http://www.iob.org/>

The IOB is the professional body representing UK biologists. The website gives details of their publications, as well as courses and events.

Genetics Society

<http://www.genetics.org.uk/>

Founded in 1919 as the world's first society devoted to the study of the mechanisms of inheritance, the Society publishes two major international scientific journals, and the website gives information about membership, educational activities and forthcoming events.

European Society of Human Genetics

<http://www.eshg.org/>

An international professional society founded in 1967 to promote research in basic and applied human and medical genetics, and to facilitate contact between all persons involved. The Society publishes the *European Journal of Human Genetics*.

SAPE: Society of Avian Paleontology and Evolution

<http://www2.nrm.se/ve/birds/sape/sape001.html.en>

The website of this Society provides access to the newsletter from 1987 and to a selection of recommended links as well as an invitation to join the mailing list.

Society for the Study of Evolution

<http://www.evolutionsociety.org/>

This American society publishes the scientific journal *Evolution* and the website also gives details on membership, travel awards, annual meetings, presentations, and speakers.

National Center for Science Education

<http://ncseweb.org/>

A not-for-profit membership organisation in the US supporting the continued teaching of evolution in schools. The website details the issues in the creationism/evolution debate.

European Society for Evolutionary Biology

<http://www.eseb.org/>

The ESEB aims to “Support the study of organic evolution and the integration of those scientific fields that are concerned with evolution” and publishes the Journal of Evolutionary Biology. The website links to Society Congresses and to related societies.

Linnean Society of London

<http://www.linnean.org/>

It was at a meeting of the Linnean Society that Darwin and Wallace’s ideas on evolution by natural selection were first presented in 1858. The website provides details of meetings and access to online collections of specimens, manuscripts and letters.

Universities, research institutes and projects

Research is carried out in various sorts of institutes as well as universities, and their websites often give quite detailed information about projects and publications produced, as well as contacts for researchers.

Centre for Bioscience, Higher Education Academy

<http://www.bioscience.heacademy.ac.uk/>

This Centre aims to support teaching in Higher Education in the biosciences. An extensive collection of educational resources is available from the website.

Natural Environment Research Council (NERC)

<http://www.nerc.ac.uk/>

The Government agency for funding research in the environmental sciences, both in universities and in its own research institutes. Research topics include biodiversity and population dynamics.

Biotechnology and Biological Sciences Research Council (BBSRC)

<http://www.bbsrc.ac.uk/>

The Government agency for funding research in the non-clinical life sciences. The website gives details of research areas covered including plants, microbes, and animals, as well as the tools and technology underpinning biological research.

Darwin Centre, Natural History Museum

<http://www.nhm.ac.uk/visit-us/galleries/orange-zone/darwin-centre/>

Advertising the opening in September 2009 of the second phase of this extension to the Natural History Museum in London, the website links to a section about evolution.

Institute of Genetics, University of Nottingham

<http://www.nottingham.ac.uk/genetics/>

This site outlines the courses offered and gives brief details of the research themes followed in the Institute (including animal behaviour and ecology, fungal biology and genetics, and population and evolutionary genetics) as well details of principal investigators.

Biology Project. Mendelian Genetics

http://www.biology.arizona.edu/mendelian_genetics/mendelian_genetics.html

A series of interactive exercises to test knowledge of basic mendelian genetics, as well as tutorials explaining the concepts and links to relevant resources, are combined here by the University of Arizona to provide a clear and concise introduction to the subject.

Department of Genetics, University of Cambridge

<http://www.gen.cam.ac.uk/>

This site provides information on the history of the Department, academic staff and their research activities, seminars and other events. There is also a link to the Genetics Library, available to visit by appointment.

CoffeeDNA

<http://www.coffeedna.net/>

Established in 2004 as a database of material relating to coffee genomics, this site is maintained by the University of Trieste, and invites collaboration from other non-profit institutions. The site incorporates several search tools, a number of sequence databases, and a form for uploading data.

John Innes Centre

<http://www.jic.ac.uk/corporate/index.htm>

This Centre, partly sponsored by the Biotechnology and Biological Sciences Research Council, aims to contribute to the fields of microbial and plant sciences, including crop genetics. The site provides information on current projects and access to relevant databases.

Molecular Ecology Laboratory

<http://swfsc.noaa.gov/textblock.aspx?Division=PRD&id=1455&ParentMeduld=243>

This Laboratory focuses on conservation genetics to support the marine mammal and sea turtle programmes of the Southwest Fisheries Science Center (California). The site offers access to a literature database on conservation genetics as well as downloadable lab protocols.

Human Genome Project Information

http://www.ornl.gov/sci/techresources/Human_Genome/home.shtml

A comprehensive collection of information relating to the Human Genome Project including background to the project, research information, and implications for medicine and new genetics, ethical, legal and social issues.

Assembling the Tree of Life (AToL)

<http://atol.sdsc.edu/>

This project, sponsored by the US National Science Foundation, aims to reconstruct the evolutionary origins of all living things by sponsoring collaborations between universities.

Allan Wilson Centre for Molecular Ecology and Evolution

<http://www.allanwilsoncentre.ac.nz/>

Research at this Centre focuses on the molecular processes that underlie evolutionary progress, and the resulting biodiversity in New Zealand. The site gives details of the research and a list of publications, some of which are available online.

National Evolutionary Synthesis Center (NESCent)

<http://www.nescent.org/>

This Center aims to “facilitate broadly synthetic research to address fundamental questions in evolutionary biology”. The website provides summaries of funded projects and calls for research proposals, as well as detailing education and outreach programmes.

Open University: Ecology and Evolution Research Group

<http://www.open.ac.uk/science/lifesciences/research/research-groups/ecology-and-evolution.php>

This well-established research group covers a broad spectrum of interests including molecular genetics, population dynamics and comparative anatomy.

Robinson Laboratory: from Society to Genes

<http://www.life.uiuc.edu/robinson/>

This research group uses the honey bee to understand the mechanisms governing social behaviour. Details are provided of research using molecular techniques to analyse behaviour, with access to the sequencing data and to the Honey Bee Genome Project.

Darwin Correspondence Project

<http://www.darwinproject.ac.uk/>

Based at Cambridge University Library, this project aims to publish the definitive edition of letters to and from Charles Darwin. The site provides an online database of about 5,000 letters up to 1865, and sections of the site are devoted to Darwin and religion, and Darwin and science.

Use Intute to discover the best of the Web for education and research

intute : health & life sciences

- The **Intute database** provides access to thousands of high-quality Internet resources, selected and described by subject specialists, and covers all key areas of genetics and evolution.
- The **Virtual Training Suite** offers free Internet training with a set of “teach-yourself” online tutorials, designed to help students develop their Internet research skills.
- Use **MyIntute** to set up email alerts about new Internet resources in your field, save your own personalised collection of Internet resources, or create reading lists of online resources for your students.
- **Working with Intute** – it’s easy to integrate Intute services into your own websites.
- **Suggest a site** – we welcome suggestions from the education sector for new sites for our database.
- We offer free **support materials** for universities and colleges, such as leaflets, worksheets, and presentations that can be adapted and used for teaching.
- Recommended subject services from Intute: Health and Life Sciences include **Hot Topics** and a **Blog**. Hot Topics consists of a monthly selection of key resources on a subject of current concern or seasonal interest, chosen by the Intute editors. The Health and Life Sciences Blog offers commentary on current events or publications with relevant subject content. In many case blog entries direct readers to appropriate records within the Intute: Health and Life Sciences collection.

An online version of this booklet can be downloaded from:

www.intute.ac.uk/subjectbooklets.html

Please
tell us what you
think of this booklet via:
[www.intute.ac.uk/
feedback.html](http://www.intute.ac.uk/feedback.html)



The University of
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