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Introduction

Neuroscience is the study of the nervous system, including not just the brain, but the spinal cord and networks of nerve cells (neurons) throughout the body. The field of neuroscience is dedicated to learning how the nervous system develops, functions, and what happens when things go wrong. Among other things, neuroscience allows us to learn more about behavior, emotion, and thought.

While neuroscience had previously been a branch within the study of biology, it is a highly interdisciplinary field, including aspects of psychology, chemistry, computer science, physics, medicine, and philosophy. Research in neuroscience covers many diverse topics, including sensation and perception, learning and memory, sleep, stress, aging, and neurological and psychiatric disorders. These topics may be studied at a cellular, molecular, genetic, or behavioral level.

At the molecular, cellular, and genetic levels, scientists use various techniques to identify molecules that are necessary for proper brain function. They can also isolate genes that cause these molecules to be produced. Finding these genes often leads to genetic theories of neurological and psychiatric disorders. Scientists interested in the anatomy of the nervous system characterize the structure and function of various parts of the brain, as well as the neurotransmitters that work within the nervous system. Developmental neuroscience studies how the brain develops and how neurons are connected from before birth throughout the life span.

Behavioral neuroscience studies human and animal behavior, including the neural processes that cause or are affected by these behaviors. Cognitive neuroscience deals with internal brain states such as perception and memory. Both of these areas often rely on neuroimaging techniques to learn more about neural processes underlying behavior and thought. Clinical neuroscience builds on basic research in other areas of the field to develop diagnostic tools, as well as prevention and treatment options for neurological and psychiatric disorders.

A newer area in the field of neuroscience involves the application of computer science. Many researchers are working on creating computer models of a working brain, including all of the neurons and their network of interconnections, to learn more about how the brain works. This area of research is in its early stages, but it holds a lot of promise for future breakthroughs in the field.

Neuroscience is a large and varied field, with an incredible number of available resources. Rather than try to cover all subfields of neuroscience, this guide focuses on resources that are broadly applicable to all branches of neuroscience. These resources can be used by students and practitioners at any level, ranging from undergraduate to seasoned researcher.
Classification

The Library of Congress Subject Heading for neuroscience is Neurosciences. Narrower terms for specific areas of neuroscience include Neurobiology, Neurochemistry, Neurogenetics, Neuroimmunology, Neuropharmacology, Neuroinformatics, and Computational Neuroscience.

The Library of Congress Classification numbers for Neurosciences are RC321-RC580. Cognitive neuroscience is classified under QP360.5. Neurophysiology and Neuropsychology are classified as QP351-QP495. Neuropsychopharmacology is RM315-RM334. Human neuroanatomy is QM451-QM471.

The Dewey Decimal Classification for Nervous System Sensory Functions is 612.8.

General Overview Books


This text covers specifically the field of cognitive neuroscience. It deals heavily with the biological basis of cognition and includes results of the latest research in the field. Topics include plasticity, false memories and insights into memory retrieval, new research on “the social brain”, and future directions for research in the discipline.


This book focuses on the interdisciplinary nature of neuroscience, drawing on information from fields as varied as evolution, philosophy, anatomy, chemistry, computer science, psychology, and brain imaging.


This three volume reference book provides an overview of neuroanatomy of all vertebrate groups, from fish to birds to mammals. It includes comparisons of the organization of the nervous system in each group of vertebrates.


This neurology textbook first outlines the history and methodology of the field, followed by in depth explorations of diseases of the nervous system, including psychiatric disorders. While this book is traditionally used as a reference for medical students and physicians, it is a useful resource for anyone in the field of neuroscience.

This text contains a broad overview of neuroscience that is as useful for advanced undergraduates and graduate students in the field as it is for professionals looking for a reference source.


This book covers recent developments in treatment for neurological disorders from basic to translational research and on to clinical use of new treatments. It provides an interesting look at the field of neuroscience, starting with the most basic level of research and following each advance through the steps of the scientific process to its use in the clinical setting.

**E-Book Repositories**

**CogNet** ([http://cognet.mit.edu/](http://cognet.mit.edu/))

CogNet is a resource developed by the MIT Press. It acts as a repository for electronic resources in cognitive science, including cognitive psychology, neuroscience, and computational intelligence. A subscription to CogNet provides access to an electronic collection of books, journals, conference proceedings, gray literature, and major reference works.

**NEUROSCIENCEnetBASE** ([http://www.crcnetbase.com/page/neuroscience_ebooks](http://www.crcnetbase.com/page/neuroscience_ebooks))

This resource from the CRC Press includes over 140 fully searchable e-books in the areas of clinical neuroscience, lab animal science, neuroscience, neuropsychology, and toxicology.

**Psychiatry Online** ([http://www.psychiatryonline.com/](http://www.psychiatryonline.com/))

Psychiatry Online is a web-based portal that features the DSM-IV-TR, the most widely used psychiatric reference in the world, as well as journals, textbooks, practice guidelines, and self-assessment tools published by American Psychiatric Publishing, Inc.

**Dictionaries**


This text includes over 10,000 terms related to neurological and psychiatric diseases, as well as psychopharmacological agents and basic neuroscience concepts.


This text contains an alphabetical listing of common neurological disorders, and is meant to be a resource for diagnosis. While this book was written for clinicians, it provides complete descriptions of many diseases and can be used as a study aid.

**Encyclopedias**


This encyclopedia contains over 1000 entries on neurology, neurosurgery, psychiatry, and other areas of neuroscience.


This four volume set covers anatomy, physiology, neuropsychology, clinical neurology, neuropharmacology, evolutionary biology, genetics, and behavioral science. It contains over 200 peer reviewed articles written by experts from around the world. It is also available online from ScienceDirect.


This 12 volume set contains almost 1,500 entries. It is meant to be an authoritative resource for everything related to neuroscience. The work can be read as self-contained entries, but each entry also contains numerous cross-references to allow for continued reading.


This encyclopedia classifies the cognitive and brain sciences into six domains: computational intelligence, culture, cognition, and evolution, linguistics and language, neuroscience, philosophy, and psychology. Each section contains an extended series of brief entries on the defining research topics of the domain. This resource is also available online through CogNet.

**Handbooks**


This work contains almost 300 articles covering a range of topics in brain theory and neural networks, both biological and artificial.
Atlases


The Allen Brain Atlas is an interactive, genome-wide image database of gene expression in the mouse brain. A combination of RNA in situ hybridization data, detailed Reference Atlases and informatics analysis tools are integrated to provide a searchable digital atlas of gene expression. Together, these resources present a comprehensive online platform for exploration of the brain at the cellular and molecular level. The Allen Brain Atlas also includes a section of the site dedicated to gene expression in the developing mouse brain, as well as the mouse spinal cord. Other projects, such as gene expression in the human cortex, are in progress.

**BrainMaps.org** ([http://brainmaps.org](http://brainmaps.org))

BrainMaps.org is an interactive zoomable high-resolution digital brain atlas and virtual microscope that is based on scanned images of serial sections of both primate and non-primate brains and that is integrated with a high-speed database for querying and retrieving data about brain structure and function over the internet. Currently featured are complete brain atlas datasets for various species. This is a great resource for students of neuroanatomy.


This atlas of the rat brain has been one of the most highly cited resources in the scientific literature since it was originally published in 1982. It is widely known as the most accurate stereotaxic map of the rat brain. It is an incredibly useful resource for anyone using the rat as an experimental model in their research.

**Journals**

There are more than 200 neuroscience journals currently published. Some of the most highly ranked journals in the field of neuroscience, as calculated by the ISI Journal Citation Reports, include:

**Annual Review of Neuroscience**  
[http://neuro.annualreviews.org/](http://neuro.annualreviews.org/)

*The Annual Review of Neuroscience* covers research in all aspects of neuroscience, including molecular and cellular neuroscience, neurogenetics, development, plasticity and repair, systems neuroscience, cognitive neuroscience, behavior, and neurobiology of disease. This journal has been published annually by Annual Reviews since 1978.

**Nature Reviews Neuroscience**  
[http://www.nature.com/nrn/](http://www.nature.com/nrn/)

*Nature Reviews Neuroscience* covers advances in neuroscience of all kinds. The scope of the journal includes cellular and molecular neuroscience, neurodevelopment, sensory, motor systems, and behavior, regulatory systems, higher cognition and language, computational
neuroscience, and disorders of the brain. This journal has been published monthly by the Nature Publishing Group since 2000.

**Neuron**  

*Neuron* publishes research in all areas of neuroscience, particularly articles that are of significance for the neuroscience community at large. This journal has been published monthly by Cell Press since 1988.

**Nature Neuroscience**  
[http://www.nature.com/neuro/](http://www.nature.com/neuro/)

*Nature Neuroscience* also broadly covers neuroscience as a discipline. Papers in *Nature Neuroscience* range in scope from molecular, cellular, systems, and cognitive neuroscience, psychophysics, computational modeling, and diseases of the nervous system. This journal has been published monthly by the Nature Publishing Group since 1998.

**Behavioral and Brain Sciences**  

*Behavioral and Brain Sciences* covers research in psychology, neuroscience, behavioral biology, and cognitive science. This journal has been published quarterly by the Cambridge University Press since 1978.

**Molecular Psychiatry**  
[http://www.nature.com/mp/](http://www.nature.com/mp/)

*Molecular Psychiatry* covers research on the biological mechanisms of psychiatric disorders and treatments. This journal has been published bimonthly by the Nature Publishing Group since 1997. All issues of this journal except those published in the last five years are freely available through the publisher’s website.

**Brain**  

*Brain* covers both clinical and pre-clinical research in neuroscience. This journal has been published by the Oxford University Press since 1878.

**Biological Psychiatry**  
[http://journals.elsevierhealth.com/periodicals/bps/home](http://journals.elsevierhealth.com/periodicals/bps/home)

*Biological Psychiatry* covers research in psychiatric neuroscience and treatment for psychiatric disorders. Articles published are both reports of both basic and clinical research. This journal has been published biweekly by the Society of Biological Psychiatry since 2006.
**Journal of Neuroscience**

http://www.jneurosci.org/

*The Journal of Neuroscience* covers a broad range of research in neuroscience. Areas of the field covered include behavioral, systems, and cognitive neuroscience, cellular and molecular neuroscience, neurodevelopment, plasticity, and repair, and the neurobiology of disease. This journal has been published by the Society for Neuroscience since 1981.

**Neuropsychopharmacology**

http://www.nature.com/npp/

*Neuropsychopharmacology* covers clinical and basic research related to substances that act within the central nervous system and identification of new molecular targets for developing new drugs. Articles in this journal are freely available on the publisher’s website beginning 12 months after publication. This journal has been published monthly by the American College of Neuropsychopharmacology since 1994.

**Brain Research Reviews**

http://www.sciencedirect.com/science/journal/01650173

*Brain Research Reviews* covers research on topics including cellular and molecular neuroscience, neurodevelopment, regeneration, and aging, neurophysiology, neuropharmacology, sensory and motor systems, regulatory systems, cognitive and behavioral neuroscience, diseases of the nervous system, and computational and theoretical neuroscience. This journal has been published by Elsevier since 1979.

**Databases**

**BIOSIS Previews/Biological Abstracts**, Published by Thomson Reuters (http://thomsonreuters.com/products_services/science/science_products/a-z/biosis_previews)

BIOSIS Previews indexes journals in a wide variety of areas ranging from zoology to microbiology, providing comprehensive coverage of all fields the life sciences. Provided by BIOSIS, the database covers material back to 1926. This content can be found in print as *Biological Abstracts*.

**CogPrints** (http://cogprints.org)

CogPrints is an open access electronic archive run by the University of Southampton. It includes self-archived papers in the fields of psychology, neuroscience, linguistics, computer science, philosophy, biology, medicine, anthropology, and other areas related to cognitive sciences.
**CSA Neurosciences Abstracts**, Published by CSA

The database covers all aspects of vertebrate and invertebrate neuroscience, emphasizing basic research but also including neurological disorders. Its print counterpart is also titled *CSA Neurosciences Abstracts*. Material covered begins in 1982.

**Neurodatabase.org**

This website is a repository of neurophysiology data sets that can be downloaded for research purposes. All data is freely available, and registered users can upload new data sets for public use. This site was created by the Laboratory of Neuroinformatics at Weill Medical College of Cornell University.

**PsycINFO/Psychological Abstracts**, Published by the American Psychological Association
(http://www.apa.org/pubs/databases/psycinfo/index.aspx)

This database covers the psychological literature beginning in 1806, a significant portion of which deals directly with the brain and aspects of neuroscience. Provided by the American Psychological Association, this bibliographic material can be found in print as *Psychological Abstracts*.

**PubMed/Medline**, Published by the National Library of Medicine
(http://www.ncbi.nlm.nih.gov/pubmed/)

PubMed is a freely available online database that indexes material in the Medline database, both of which are run by the National Library of Medicine. Medline covers medicine as well as preclinical research. Neurology and other neuroscience-related topics can be found in abundance.

**Science Direct**, Published by Elsevier (http://www.sciencedirect.com/)

This database provides coverage of more than 1800 peer-reviewed journals published by Elsevier in science, technology / engineering, and medicine. The homepage includes a direct link to neuroscience under its list of subjects.

**Web of Science/SciSearch/Science Citation Index**, Published by Thomson Reuters
(http://thomsonreuters.com/products_services/science/science_products/a-z/web_of_science?parentKey=433717,571933)

This source is a multidisciplinary index of literature in science, technology, medicine, and related disciplines. The database can be found online in SciSearch (either through Dialog or the web interface of Web of Science) and in print as *Science Citation Index*. 
Websites

The Brain from Top to Bottom ([http://thebrain.mcgill.ca/flash/index_a.html](http://thebrain.mcgill.ca/flash/index_a.html))

This site, run by the Canadian Institutes of Health Research, Institute of Neurosciences, Mental Health, and Addiction, is an interactive primer on the human brain and behavior. Each of the site’s twelve main topics can be accessed at a beginner, intermediate, or advanced level. Users can also browse the site by level of organization – molecular, cellular, neurological, psychological, or social. A guided tour of the site is offered, or users can browse for topics of their own.

Comparative Mammalian Brain Collections ([http://brainmuseum.org/](http://brainmuseum.org/))

This site acts as an electronic archive for photos of brain sections of mammalian brains. The goal of the site is to promote the study of comparative neuroanatomy. The site also includes tutorials on the development, evolution, and function of the brains of mammals. The original collections used to create this archive are located at the University of Wisconsin – Madison, Michigan State University, and the National Museum of Health and Medicine.

The Whole Brain Atlas ([http://www.med.harvard.edu/AANLIB/home.html](http://www.med.harvard.edu/AANLIB/home.html))

This site provides MRI, CT, and PET images of the human brain. Visitors to the site can view a normal brain, as well as brains that have been damaged by strokes and other neurological disorders. It provides useful information for advanced students or practitioners of neuroscience.

Neuroscience Information Framework ([http://neuinfo.org](http://neuinfo.org))

The Neuroscience Information Framework is a project of the NIH Blueprint for Neuroscience Research. Its goal is to advance neuroscience research by enabling discovery and access to public research data and tools worldwide using an open source, networked environment. The NIF includes a vast archive of neuroscience literature, a wiki of neuroscience terms, and various other tools.

The Washington University School of Medicine Neuroscience Tutorial ([http://thalamus.wustl.edu/course/](http://thalamus.wustl.edu/course/))

This site was created as a companion to first year medical school instruction on neuroanatomy. It contains useful information about the structure and function of the human brain, as well as numerous easy to understand diagrams depicting various structures and pathways.

The Brain Observatory ([http://thebrainobservatory.ucsd.edu/](http://thebrainobservatory.ucsd.edu/))

The Brain Observatory is dedicated to the study of the architecture of the human brain. Using multiple neuroimaging techniques, this group from the University of California, San Diego illustrates the detailed structural design of the brain and aims to understand how cognitive systems are affected by neurological diseases. This site was most recently in the news in
December 2009 for posting live streaming video of members of the lab carefully sectioning the brain of H.M., the world’s most famous amnesiac.

Professional Associations and Research Groups

**Society for Neuroscience** ([http://sfn.org](http://sfn.org)) – SfN is the world's largest organization of scientists and physicians devoted to advancing understanding of the brain and nervous system. SfN also provides professional development and education to its members, promotes education of the public and of policymakers. Each fall, SfN hosts its annual meeting, one of the premier neuroscience conferences in the world.

**American Psychological Association** ([http://apa.org](http://apa.org)) – APA is the world’s largest professional organization of psychologists in the world. The organization’s mission is to advance psychological knowledge for the benefit of people everywhere. There are several divisions within the APA that are directly relevant to neuroscientists, including Behavioral Neuroscience and Comparative Psychology, Psychopharmacology and Substance Abuse, and Clinical Neuropsychology.

**American Neurological Association** ([http://www.aneuroa.org/](http://www.aneuroa.org/)) – The ANA is a professional society of academic neurologists and neuroscientists devoted to advancing the goals of academic neurology; to training and educating neurologists and other physicians in the neurologic sciences; and to expanding both our understanding of diseases of the nervous system and our ability to treat them.