

## How and where to obtain information on Neurospora

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### Background

A vast primary literature is amply covered by reviews, monographs, and compendia. These are now complemented and made accessible by electronic sources of information and by search engines.

A working Neurospora laboratory should probably have Davis's book and the 2001 Neurospora Compendium available for reference. It should subscribe to the *Fungal Genetics Newsletter* and should be on mailing lists managed by the Fungal Genetics Stock Center, to receive the *Neurospora E-News*, announcements of meetings, etc. URLs for the following Internet sources should be kept readily available, included in *Bookmarks* or *Favorites*.

### Useful internet sources

- **Neurospora Home Page:** <http://www.fgsc.net/Neurospora/index.html>  
Section headings: *The Foundation of Neurospora Biology, An Introduction to Neurospora Research, Neurospora Genetic Databases, Experimentsl Methods, Ideas for Student Labs, Photo Galleries.*
- **Fungal Genetics Stock Center Home Page:** <http://www.fgsc.net/>  
Section headings: *Information Regarding FGSC (including catalog, mailing list), Biological Materials, Organism Information, Genome Resources, Additional Resources (including Newsletters), Meetings, Google Search of FGSC Site.*
- **The Neurospora E-Compendium:**  
[http://www.bioinf.leeds.ac.uk/%7Egen6ar/newgenelist/genes/gene\\_list.htm](http://www.bioinf.leeds.ac.uk/%7Egen6ar/newgenelist/genes/gene_list.htm)  
This brings together, with search and browse utilities, information on all named genes, including location on the genetic and physical maps, sequence codes, gene product, phenotype description, references (with links to PubMed). It includes, corrects, and complements information in the 2001 Neurospora Compendium, adding new entries on all *N. crassa* loci recognized and named since 2000.
- **The 2001 Neurospora Compendium:**  
<http://www.fgsc.net/2000compendium/NewCompend.html>  
A compilation of information on all chromosomal loci established prior to completion of the *N. crassa* genome sequence, with background material on Neurospora, and appendices headed *Neurospora Genetic Nomenclature, Genetic Maps and Mapped Loci, Data for RFLP Mapping, The N. crassa Mitochondrial Genome, Expressed Sequences from Different Stages of the Neurospora Life Cycle.* 2300 references.
- **The Neurospora Genome Project:** <http://www.dartmouth.edu/%7Eneurosporagenome/>  
This ongoing NIH-sponsored program, initiated in 2004, involves nine institutions. It consists of four major projects: *Gene Disruptions, Annotation and Genomics, Transcriptional Profiling, and EST Libraries & SNPs.* Knockouts will be announced and made available as they are obtained.
- **The Neurospora Genome Sequence:**  
[http://www.broad.mit.edu/annotation/fungi/neurospora\\_crassa\\_7/index.html](http://www.broad.mit.edu/annotation/fungi/neurospora_crassa_7/index.html)  
<http://mips.gsf.de/proj/neurospora/>
- **The NIH Neurospora/Model Organism Page:**  
<http://www.nih.gov/science/models/neurospora/>
- **Textpresso:** <http://www.textpresso.org/nspora/>

A search engine of *N. crassa* literature powered by the Textpresso project. As of 11/05, this is based on 1733 full text articles pertaining to fungus biology that were published from 1986-2005. This site contains articles from 21 journals, but the majority come from *Fungal Genetics Biology*, *Genetics*, and *Journal of Biological Chemistry*. The full text of these articles can be searched using keywords and/or categories from the Textpresso ontology.

- ***The Neurospora Bibliography***: <http://www.fgsc.net/scripts/biblio.asp>  
This bibliography includes all the references in the 1965 *Neurospora Bibliography and Index* by Bachman and Strickland, and in subsequent supplements published annually in the *Neurospora Newsletter/Fungal Genetics Newsletter*. (For publications in recent years not yet incorporated, see individual Newsletters.) Searchable by author, title, date, or journal.
- ***Photographs***: <http://www.stanford.edu/group/neurospora/Photos.html>  
A microscopic examination by N. B. Raju of meiosis, ascus development, and other events in the sexual phase.

### ***Useful reference works, compilations, landmark papers, and reviews***

The following list is paralleled by similar lists at other web sites (e.g., <http://www.stanford.edu/group/neurospora/index.html>, <http://www.nih.gov/science/models/neurospora/>, <http://www.fgsc.net/>). Some of these sites may be more informative than others, depending on inclusiveness and on the frequency of updating of the site.

### ***General***

Davis, R. H. 2000. *Neurospora: Contributions of a Model Organism*. Oxford University Press, New York.

### ***Compendia***

Perkins, D. D., A. Radford, and M. S. Sachs. 2001. *The Neurospora Compendium: Chromosomal Loci*. Academic Press, San Diego. <http://www.fgsc.net/2000compendium/NewCompend.html>. This book is complemented and updated by the on-line E-Compendium (2005 and continuing). See above.

Perkins, D. D., A. Radford, D. Newmeyer, and M. Björkman, 1982. Chromosomal loci of *Neurospora crassa*. *Microbiol. Rev.* 46: 426-570. <http://www.fgsc.net/compend/compend.html>

Perkins, D. D. 1997. Chromosome rearrangements in *Neurospora* and other filamentous fungi. *Adv. Genet.* 36: 239-398. <http://www.stanford.edu/group/neurospora/OldPDFs/PerkinsAdvGen97.pdf>

### ***Genome annotation***

Borkovich, K. A., L. A. Alex, O. Yarden, M. Freitag, G. E. Turner, N. D. Read, S. Seiler, D. Bell-Pedersen, J. Paietta, N. Plesofsky, M. Plamann, M. Goodrich-Tanrikulu, U. Schulte, G. Mannhaupt, F. E. Nargang, A. Radford, A., C. Selitrennikoff, J. E. Galagan, J. C. Dunlap, J. J. Loros, D. Catcheside, H. Inoue, R. Aramayo, M. Plamann, E. U. Selker, M. S. Sachs, G. A. Marzluf, I. Paulsen, I., R. Davis, D. J. Ebbole, A. Zelter, E. R. Kalkman, R. O'Rourke, F. Bowring, J. Yeadon, C. Ishii, K. Suzuki, W. Sakai, and R. Pratt. 2004. Lessons from the genome sequence of *Neurospora crassa*: Tracing the path from genomic blueprint to multicellular organism. *Microbiol. Mol. Biol. Rev.* 68: 1-108. <http://mibr.asm.org/cgi/reprint/68/1/1>

Radford, A. 2004. Metabolic highways of *Neurospora crassa* revisited. *Adv. Genet.* 52: 165-207.

### ***Historical***

Shear, C. L., and B. O. Dodge. 1927. Life histories and heterothallism of the red bread-mold fungi of the *Monilia sitophila* group. *J. Agr. Res.* 34: 1019-1042.

<http://www.stanford.edu/group/neurospora/UsefulPDFs/1927Shear-Dodge.Neurospora.pdf>

Dodge, B. O. 1927. Nuclear phenomena associated with heterothallism in the ascomycete *Neurospora*. *J. Agr. Res.* 35: 289-305.

<http://www.stanford.edu/group/neurospora/UsefulPDFs/1927Dodge.NucPhen.pdf>

Beadle, G. W., and E. L. Tatum. 1941. Genetic control of biochemical reactions in *Neurospora*. *Proc. Nat. Acad. Sci. USA* 27: 499-

506. <http://www.stanford.edu/group/neurospora/UsefulPDFs/1941Beadle-Tatum.pdf>

Horowitz, N. H. 1991. Fifty years ago: The *Neurospora* revolution. *Genetics* 127: 631-636.

<http://www.genetics.org/content/vol127/issue4/index.shtml>

Perkins, D. D. 1992. *Neurospora*: The organism behind the molecular revolution. *Genetics* 130: 687-701. <http://www.genetics.org/content/vol130/issue4/index.shtml>

Horowitz, N. H. 1973. *Neurospora* and the beginnings of molecular genetics. *Neurospora Newslett.* 20: 4-6. <http://www.fgsc.net/fgn/nn20/20Horowitz.pdf>

Horowitz, N. H. 1985. The origins of molecular genetics: One gene, one enzyme. *BioEssays* 3: 37-39.

<http://www3.interscience.wiley.com/cgi-bin/jissue/109911484>

Fincham, J. R. S. 1985. From auxotrophic mutants to DNA sequences. In *Gene Manipulation in Fungi*. (J. W. Bennett and L. L. Lasure, eds.). pp. 3-34. Academic Press.

Perkins, D. D., 1992 *Neurospora* chromosomes. In *The Dynamic Genome: Barbara McClintock's Ideas in the Century of Genetics* (N. Federoff and D. Botstein, eds.) pp. 33-44. Cold Spring Harbor Laboratory Press.

<http://www.stanford.edu/group/neurospora/UsefulPDFs/PerkinsChromosomes92.pdf>

Perkins, D. D., and R. H. Davis. 2000. *Neurospora* at the millennium. *Fungal Genet. Biol.* 31: 153-167. <http://www.stanford.edu/group/neurospora/pdfs/Perkins&Davis2000b.pdf>

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[Perkins](#), D. D., and R. H. Davis. 2002. *Neurospora* chronology -- 1843–2002. *Fungal Genet. Newslett.* 49: 4-8. <http://www.fgsc.net/fgn49/fgn49PerkinsChrono.htm>

Robbins, W. J. 1962. Bernard Ogilvie Dodge, April 18, 1872–August 9, 1960. *Biographical. Memoirs Nat. Acad. Sci. USA* 36: 85-124.

Horowitz, N. H. 1990. George Wells Beadle, October 22, 1903–June 9, 1989. *Biographical. Memoirs Nat. Acad. Sci. USA* 59: 26-52.

[http://www.stanford.edu/group/neurospora/UsefulPDFs/1990Beadle%20Memoir%20\(Horowitz\).pdf](http://www.stanford.edu/group/neurospora/UsefulPDFs/1990Beadle%20Memoir%20(Horowitz).pdf)

Lederberg, J. 1990. Edward Lawrie Tatum, December 14, 1909–November 7, 1975. Biographical. *Memoirs Nat. Acad. Sci. USA* 59: 356-386.  
[http://www.stanford.edu/group/neurospora/UsefulPDFs/1990Tatum%20Memoir%20\(Lederberg\).pdf](http://www.stanford.edu/group/neurospora/UsefulPDFs/1990Tatum%20Memoir%20(Lederberg).pdf)

Fincham, J. R. S., and B. John. 1995. David Guthrie Catcheside, 31 May 1907–1 June 1994. *Biographical Memoirs Fellows Royal Soc.* 41: 119-134. <http://www.jstor.org/cgi-bin/jstor/printpage/00804606/ap030043/03a00080/0-150.pdf?backcontext=results&dowhat=Acrobat&config=&userID=ab403d72@stanford.edu/01cc993341231a10bfd920fed&0-150.pdf>

Radford, A., and R. H. Davis. 2005. John R. S. Fincham (1926–2005): A life in microbial genetics. *Genetics* 171: 1-5. <http://www.genetics.org/cgi/reprint/171/1/1>

### ***Bibliographies***

Fungal Genetics Stock Center. *Neurospora Bibliography*.  
<http://www2.kumc.edu/scripts/fgsc/biblio.asp>

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Bachmann, B. J. 1970. *Neurospora bibliography and index: Number two, 1964-1969*. *Neurospora Newslett.* 17: 3-80.

Perkins, D. D. 1994 *Neurospora tetrasperma* bibliography. *Fungal Genet. Newslett.* 41: 69-78.  
<http://www.fgsc.net/fgn41/tetbib.html>

Perkins, D. D. 2003. *Neurospora tetrasperma* bibliography -- Additions. *Fungal Genet. Newslett.* 50: 24-26. <http://www.fgsc.net/fgn50/ntetbib50.htm>

### ***Methods***

Bell Pedersen, D. (ed). 2006 and continuing. [*Neurospora Methods Handbook*.]  
<http://www.fgsc.net/Neurospora/NeurosporaProtocolGuide.htm>

Davis, R. H., and F. J. de Serres. 1970. Genetic and microbiological research techniques for *Neurospora crassa*. *Meth. Enzymol.* 17A: 79-143.

Davis, R. H. 2000. Genetic, biochemical, and molecular techniques. Chapter 14, pp. 283-303 in *Neurospora: Contributions of a Model Organism*. Oxford University Press, New York.

Perkins, D. D., 1986 Hints and precautions for the care, feeding and breeding of *Neurospora*. *Fungal Genet. Newslett.* 33: 35-41. <http://www.fgsc.net/fgn33/3perkins33.pdf>

Ryan, F. J. 1950. Selected methods of *Neurospora* genetics. *Methods Med. Res.* 3: 51-75.

Perkins, D. D. 1999. *Neurospora* genetic nomenclature. *Fungal Genet. Newslett.* 46:34-41. (Reprinted in Davis 2000, Perkins *et al.*, 2001) <http://www.fgsc.net/fgn46/perkins.htm>

**Special topics**

- ***Mating type, the sexual cycle***

Glass, N. L., and M. A. Nelson. 1994. Mating-type genes in mycelial ascomycetes. In *The Mycota, Vol. I: Growth, Differentiation and Sexuality*. (J. G. H. Wessels and F. Meinhardt, eds.) pp. 295-306. Springer-Verlag.

Shiu, P. K. T., and N. L. Glass. 2000. Cell and nuclear recognition mechanisms mediated by mating type in filamentous ascomycetes. *Curr. Opin. Microbiol.* 3 183-188.

Debuchy, R., and B. G. Turgeon. 2005. Mating-type structure, evolution, and function in Euascomycetes. In *The Mycota, Vol. 1 2<sup>nd</sup> ed.* (in press).

Metzenberg, R. L. 1995. The sexual cycle in *Neurospora* from fertilization to ascospore discharge. In: *Biotechnology of Ectomycorrhizae: Molecular Approaches*. (Stocchi, V., P. Bonfante, and M. Nuti, eds.). pp. 85-98 New York. Plenum Press.

Raju, N. B. 1992. Genetic control of the sexual cycle in *Neurospora*. *Mycol. Res.* 96: 241-262. <http://www.stanford.edu/group/neurospora/OldPDFs/1992Raju.SexualCycleReview.pdf>

- ***Heterokaryons, vegetative incompatibility***

Glass, N. L., and S. J. Saupe. 2002. Vegetative incompatibility in filamentous ascomycetes. In: *Molecular Biology of Fungal Development*. (H. D. Osiewacz, ed.). Marcel Dekker, New York. pp. 109-131.

Glass, N. L., D. J. Jacobson, and, P. K. T. Shiu. 2000. The genetics of hyphal fusion and vegetative incompatibility in filamentous ascomycete fungi. *Annu. Rev. Genet.* 34: 165-186. <http://arjournals.annualreviews.org/doi/full/10.1146/annurev.genet.34.1.165>

Davis, R. H. 1966. Mechanisms of inheritance. 2. Heterokaryosis. In *The Fungi: An Advanced Treatise. Vol. 2* (G. C. Ainsworth and A. S. Sussman, eds.) pp. 567-588. Academic Press.

- ***Genetics and cytogenetics***

Davis, R. H., 2004. Genetics of *Neurospora*. In *The Mycota, Vol. 2: Genetics and Biotechnology. 2nd edition*. (U. Kück, ed.), pp. 295-306. Springer-Verlag.

Perkins, D. D., and E. G. Barry, 1977 The cytogenetics of *Neurospora*. *Adv. Genet.* 19: 133-285. <http://www.stanford.edu/group/neurospora/OldPDFs/PerkinsAdvGen77.pdf>

Perkins, D. D., 1979 *Neurospora* as an object for cytogenetic research. *Stadler Genet. Symp.* 11: 145-164. <http://www.stanford.edu/group/neurospora/OldPDFs/PerkinsStadler79.pdf>

Raju, N. B. 1980. Meiosis and ascospore genesis in *Neurospora*. *European J. Cell Biol.* 23: 208-223. <http://www.stanford.edu/group/neurospora/OldPDFs/1980Raju.MeiosisReview.pdf>

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Emerson, S. 1966. Mechanisms of inheritance. 1. Mendelian. In *The Fungi: An Advanced Treatise. Vol. 2.* (G. C. Ainsworth and A.S. Sussman, eds.) pp. 513-566. Academic Press.

Stadler, D. R. 1996. Meiotic recombination in filamentous fungi. *J. Genet.* 75: 265-280.

- ***Metabolism, regulation, transport***

Radford, A. 2004. Metabolic highways of *Neurospora crassa* revisited. *Adv. Genet.* 52: 165-207.

Davis, R. H. 1986. Compartmental and regulatory mechanisms in the arginine pathways of *Neurospora crassa* and *Saccharomyces cerevisiae*. *Microbiol. Rev.* 50: 280-313.

<http://www.pubmedcentral.gov/picrender.fcgi?artid=373072&blobtype=pdf>

Sachs, M. S. 1996. General and cross-pathway controls of amino acid biosynthesis. In *The Mycota, Vol. 3. Biochemistry and Molecular Biology.* (R. Brambl and G. A. Marzluf, eds.), pp. 316-345. Springer-Verlag.

- ***Mitochondria and mitochondrial plasmids***

Kennell, J. C., R. A. Collins, A. J. F. Griffiths, and F. E. Nargang. 2004. Mitochondrial genetics of *Neurospora*. In *The Mycota, Vol. 2: Genetics and Biotechnology. 2nd edition.* (U. Kück, ed.), pp. 95-112. Springer-Verlag.

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- ***RIP and silencing***

Selker, E. U. 1990. Premeiotic instability of repeated sequences in *Neurospora crassa*. *Annu. Rev. Genet.* 24: 579-614.

[http://arjournals.annualreviews.org/action/doSearch?action=runSearch&type=advanced&result=true&prevSearch=%2Bauthorsfield%3A\(Selker,EU\)](http://arjournals.annualreviews.org/action/doSearch?action=runSearch&type=advanced&result=true&prevSearch=%2Bauthorsfield%3A(Selker,EU))

Selker, E. U. 2002. Repeat-induced gene silencing in fungi. *Adv. Genet.* 46: 439-450.

Pickford, A. S., C. Catalanotto, C. Cogoni, and G. Macino. 2002. Quelling in *Neurospora crassa*. *Adv. Genet.* 46: 277-303.

Cogoni, C. 2001. Homology-dependent gene silencing mechanisms in fungi. *Annu. Rev. Microbiol.* 55: 381-406.

<http://arjournals.annualreviews.org/doi/full/10.1146/annurev.micro.55.1.381?prevSearch=authorsfield%3A%28Cogoni%2CC%29>

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<http://www.nature.com/cgi-taf/DynaPage.taf?file=/ng/journal/v30/n3/full/ng0302-245.html>

Shiu, P. K. T., D. Zickler, N. B. Raju, G. Ruprick-Robert, and R. L. Metzenberg. 2006.. SAD-2 is required for meiotic silencing by unpaired DNA and perinuclear localization of SAD-1 RdRP. *Proc. Nat. Acad. Sci. USA* 103: 2243-2248. <http://www.pnas.org/cgi/reprint/103/7/2243>.

- *Natural populations, species recognition*

Turner, B. C., D. D. Perkins, and A. Fairfield. 2001. Neurospora from natural populations: A global study. *Fungal Genet. Biol.* 32: 67-92.  
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Perkins, D. D., and B. C. Turner. 1988. Neurospora from natural populations: Toward the population biology of a haploid eukaryote. *Exp. Mycol.* 12: 91-131.  
<http://www.stanford.edu/group/neurospora/OldPDFs/PerkinsExpMycol88.pdf>

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<http://www.jstor.org/browse/00030147/di006343/00p0014z/0?frame=noframe&userID=ab403d74@stanford.edu/01cc993341005014af584&backcontext=page&backurl=/cgi-bin/jstor/viewitem/00030147/di006343/00p0014z/0%3fframe%3dnoframe%26dpi%3d3%26userID%3dab403d74@stanford.edu/01cc993341005014af584%26PAGE%3d0%26config%3djstor&onfig=jstor>

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<http://www.stanford.edu/group/neurospora/pdfs/Dettman-EVOL-2721.pdf>

- *Circadian rhythms, photobiology*

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Lauter, F.-R. 1996. Molecular genetics of fungal photobiology. J. Genet. 75: 375-386.

- ***Mutation and DNA repair***

Schroeder, A.L., H. Inoue, and M.S. Sachs. 1998. DNA repair in *Neurospora*. In *DNA Damage and Repair. Vol. 1: Biochemistry, Genetics, and Cell Biology*. pp. 503-538. (J.A. Nickoloff and M.F. Hoekstra, eds.). Humana Press, Totowa, NJ.

- ***Toxic levels of drugs, antibiotics, and antagonists***

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- ***Curves showing growth rate as a function of temperature and of pH***

Ryan, F. J., G. W. Beadle, and E. L. Tatum. 1943. The tube method of measuring the growth rate of *Neurospora*. *Am. J. Bot.* 30: 784-799. <http://links.jstor.org/sici?sici=0002-9122%28194312%2930%3A10%3C784%3ATTMOMT%3E2.0.CO%3B2-M>

- ***Curves showing ascospore germination as a function of the temperature and duration of heatshock***

Goddard, D. R. 1935. The reversible heat activation inducing germination and increased respiration in the ascospores of *Neurospora tetrasperma*. *J. Gen. Physiol.* 19: 45-60. <http://intl.jgp.org/cgi/reprint/19/1/45>

OR

Goddard, D. R. 1939. The reversible heat activation of respiration in *Neurospora*. *Cold Spring Harbor Symp. Quant. Biol.* 7: 362- 376.

Lindgren, C. C. 1932. The genetics of *Neurospora*. I. The inheritance of response to heat-treatment. *Bull. Torrey Botan. Club* 59: 85-102. <http://links.jstor.org/sici?sici=0040-9618%28193202%2959%3A2%3C85%3ATGONIT%3E2.0.CO%3B2-3>

- ***Curves showing size distribution among microconidia and macroconidia***



Gillie, O. J. 1967. Use of the Coulter counter to measure the numbers and size distribution of macroconidia and microconidia of *Neurospora crassa*. *Neurospora Newslett.* 11: 16.  
<http://www.fgsc.net/fgn/nn11/11gillie.pdf>

- ***Pedigrees showing derivation of the standard N. crassa Oak Ridge wild type strains***

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