

Neurulation

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Neurulation is a part of organogenesis in vertebrate embryos. Steps of neurulation include the formation of the dorsal nerve cord, and the eventual formation of the central nervous system. The process begins when the notochord induces the formation of the central nervous system by signaling the ectoderm germ layer above it to form the thick and flat neural plate. The neural plate folds in upon itself to form the neural tube, which will later differentiate into the spinal cord and the brain, eventually forming the central nervous system. Different portions of the neural tube form by two different processes, called primary and secondary neurulation, in different species. * In primary neurulation, the neural plate creases inward until the edges come in contact and fuse. * In secondary neurulation, the tube forms by hollowing out of the interior of a solid precursor. ([From the Wikipedia article Neurulation](#).)

Recent Publications on Neurulation:



- [Rpl30 and Hmgb1 are Required for Neurulation in Golden Hamster.](#)
*Neural tube defects (NTDs) are a group of severe congenital malformations...*20th November, 2009
Department of Histology and Embryology, Weifang Medical College, Weifang,- Int J Neurosci. 2009;119(8):1076-1090.
- [Genetics and development of neural tube defects.](#)
*Congenital defects of neural tube closure (neural tube defects; NTDs) are...*18th November, 2009
Neural Development Unit, UCL Institute of Child Health, London, UK.- J Pathol. 2009 Nov 13. ([DOI Direct Link](#))
- [Regulation of pre-otic brain development by the cephalic neural crest.](#)
*Emergence of the neural crest (NC) is considered an essential asset in the...*17th November, 2009
Institut de Neurobiologie-Alfred Fessard, Laboratoire Developpement,- Proc Natl Acad Sci U S A. 2009 Sep 15;106(37):15774-9. Epub 2009 Aug 31. ([DOI Direct Link](#))
- [Sonic hedgehog regulates integrin activity, cadherin contacts, and cell polarity to orchestrate neural tube morphogenesis.](#)
*In vertebrates, the embryonic nervous system is shaped and patterned by a...*11th November, 2009
Universite Pierre et Marie Curie-Paris 6, Paris, France.- J Neurosci. 2009 Oct 7;29(40):12506-20. ([DOI Direct Link](#))
- [Xenopus development from late gastrulation to feeding tadpole in simulated microgravity.](#)
*Microgravity (microG) is known to influence cytoskeletal structure, but...*31st October, 2009
Department of Biology, University of Northern Iowa, IA, USA.- Int J Dev Biol. 2009 Sep 18. ([DOI Direct Link](#))
- [Molecular mechanisms controlling brain development: an overview of neuroepithelial secondary organizers.](#)
*The vertebrate Central Nervous System (CNS) originates from the embryonic...*31st October, 2009

- Alicante Neuroscience Institute, Miguel Hernandez University, CSIC, San- Int J Dev Biol. 2009 Sep 25. ([DOI Direct Link](#))
- [Modelling apical constriction in epithelia using elastic shell theory.](#)
*Apical constriction is one of the fundamental mechanisms by which...*28th October, 2009
Oxford Centre for Industrial and Applied Mathematics, Mathematical- Biomech Model Mechanobiol. 2009 Oct 27. ([DOI Direct Link](#))
 - [Characterization of SoxB2 and SoxC genes in amphioxus \(Branchiostoma belcheri\): Implications for their evolutionary conservation.](#)
*Most Sox genes directly affect cell fate determination and...*6th October, 2009
Institute of Developmental Biology, Life Science College, Key Lab of- Sci China C Life Sci. 2009 Sep;52(9):813-22. Epub 2009 Oct 6. ([DOI Direct Link](#))
 - [Stepwise maturation of apicobasal polarity of the neuroepithelium is essential for vertebrate neurulation.](#)
*During vertebrate neurulation, extensive cell movements transform the flat...*3rd October, 2009
Department of Ophthalmology, University of Pittsburgh School of Medicine,- J Neurosci. 2009 Sep 16;29(37):11426-40. ([DOI Direct Link](#))
 - [Genetic basis of neural tube defects.](#)
*Neural tube defects (NTDs) represent a common group of severe congenital...*26th September, 2009
Department of Pediatrics, University of Iowa, Iowa City, IA, USA.- Semin Pediatr Neurol. 2009 Sep;16(3):101-10. ([DOI Direct Link](#))
 - [Functional dissection of XDppa2/4 structural domains in Xenopus development.](#)
*The maintenance of pluripotency in mammalian embryonic stem cells depends...*24th September, 2009
Institute of Biochemistry, University of Ulm, Albert-Einstein-Allee 11,- Mech Dev. 2009 Dec;126(11-12):974-89. Epub 2009 Sep 20. ([DOI Direct Link](#))
 - [Detecting Mitoses in Time-Lapse Images of Embryonic Epithelia Using Intensity Analysis.](#)
*Although the frequency and orientation of mitoses can significantly affect...*17th September, 2009
Department of Systems Design Engineering, University of Waterloo,- Ann Biomed Eng. 2009 Sep 15. ([DOI Direct Link](#))
 - [Apical constriction: A cell shape change that can drive morphogenesis.](#)
*Biologists have long recognized that dramatic bending of a cell sheet may...*16th September, 2009
Biology Department, University of North Carolina at Chapel Hill, Chapel- Dev Biol. 2009 Sep 12. ([DOI Direct Link](#))
 - [Sox17 Expression Patterns during Gastrulation and Early Neurulation in the Rabbit Suggest Two Sources of Endoderm Formation.](#)
*Most gastrointestinal tract and associated gland epithelia originate from...*5th September, 2009
Abteilung Anatomie und Embryologie, Zentrum Anatomie,- Cells Tissues Organs. 2009 Sep 3. ([DOI Direct Link](#))
 - [Neurocutaneous melanosis and the Dandy-Walker complex: an uncommon but not so insignificant association.](#)
*BACKGROUND: Neurocutaneous melanosis represents a rare congenital but...*28th August, 2009
Department of Pediatric Neurosurgery, Hopital Roger Salengro, Centre- Childs Nerv Syst. 2009 Dec;25(12):1533-9. Epub 2009 Aug 27. ([DOI Direct Link](#))

Neurulation Patents:



- 6492173- [Antisense inhibition of cyclin D2 expression](#)
- 6664075- [Nucleic acids encoding hedgehog proteins](#)
- 6686198- [Method of inducing and maintaining neuronal cells](#)
- 6692943- [Persephin and related growth factors](#)
- 6696260- [Methods to identify growth differentiation factor \(GDF\) binding proteins](#)
- 6709842- [DNA encoding a growth factor specific for epithelial cells](#)
- 6716597- [Methods and products for regulating cell motility](#)
- 6716600- [Persephin and related growth factors](#)
- 6723698- [Methods and compositions for the treatment of motor neuron injury and neuropathy](#)
- 6770626- [Tissue remodeling](#)
- 6833132- [Method of stimulating epithelial cells using keratinocyte growth factor \(KGF\) and method of inhibiting KGF activity](#)
- 6656475- [Growth differentiation factor receptors, agonists and antagonists thereof, and methods of using same](#)
- 6645715- [Artificial cornea](#)
- 6630148- [Compositions comprising hedgehog proteins](#)
- 6495513- [Morphogen-enhanced survival and repair of neural cells](#)
- 6500640- [Nucleic acid molecules encoding modified dorsal tissue affecting factor](#)
- 6506729- [Methods and compositions for the treatment and prevention of Parkinson's disease](#)
- 6514724- [Hedgehog interacting proteins and uses related thereto](#)
- 6566092- [DNA encoding a vertebrate homolog of hedgehog, Vhh-1, expressed by the notochord, and uses thereof](#)
- 6576237- [Vertebrate tissue pattern-inducing proteins, and uses related thereto](#)
- 6605700- [Human patched genes and proteins, and uses related thereto](#)
- 6607913- [Vertebrate embryonic pattern-inducing proteins and uses related thereto](#)
- 6608717- [Optical coherence microscope and methods of use for rapid in vivo three-dimensional visualization of biological function](#)
- 6610656- [Method of promoting chondrocyte differentiation with hedgehog related polypeptides](#)
- 6891082- [Transgenic non-human animals expressing a truncated activintype II receptor](#)
- 6902881- [Compounds and methods for regulating cell differentiation](#)
- 7306903- [Methods and compositions for identifying morphogen analogs](#)
- 7309695- [Pharmaceutical compositions for the prevention and treatment of atherosclerosis and restenosis after PTCA](#)
- 7390826- [Inhibitors of animal cell motility and growth](#)
- 7393682- [Polynucleotides encoding promyostatin polypeptides](#)
- 7393918- [Protein binding miniature proteins and uses thereof](#)
- 7408048- [Mammalian grainyhead transcription factors](#)
- 7413901- [Method of forming vertebrate pancreas in vitro](#)
- 7563596- [Method of modulating tissue growth using Frzb protein](#)
- 7566768- [Promyostatin peptides and methods of using same](#)
- 7585501- [Compositions and methods for treating kidney disease](#)
- 7285532- [Therapeutic method for treating bone formation diseases](#)
- 7271254- [Promoting cardiac cell differentiation](#)
- 7264968- [Method of inducing and maintaining neuronal cells](#)
- 6924367- [Method of modulating tissue growth using Frzb Protein](#)
- 6987211- [Transgenic non-human mammals producing a cholinesterase in their milk](#)
- 7026291- [Epithelial cell specific growth factor, keratinocyte growth factor \(KGF\)](#)
- 7049291- [Isolation and method of using tissue growth-inducing Frzb protein](#)
- 7060450- [Screening assays for agonists and antagonists of the hedgehog signaling pathway](#)
- 7115394- [Hedgehog interacting proteins and uses related thereto](#)
- 7119248- [Antibodies against epitopes with homology to self antigens, methods of preparation and applications thereof](#)
- 7144732- [Vertebrate embryonic pattern-inducing proteins and uses related thereto](#)

- 7153684- [Pluripotential embryonic stem cells and methods of making same](#)
- 7211434- [Primitive neural stem cells and method for differentiation of stem cells to neural cells](#)
- 7585671- [Hedgehog interacting proteins and uses related thereto](#)

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