BIO SKETCH

NAME : Alain CHEDOTAL

POSITION TITLE : INSERM DR1 (Research Director), Principal Investigator

EDUCATION / TRAINING

INSTITUTION AND LOCATION	DEGREE	Month/Year	FIELD OF STUDY
Ecole Normale Supérieure de Lyon, France	BS	1988-1992	Biology
UPMC Paris 6 University, Paris, France	Master	1989-1990	Neuroscience
UPMC Paris 6 University, Paris, France	Ph.D.	1992-1995	Neural Development
U.C. Berkeley, USA	Post-Doc	1995-1997	Axon Guidance

POSITIONS AND EMPLOYMENTS

2008–Pres: Directeur de Recherche INSERM (DR1), coordinator of the Department of Development, group leader, INSERM U968, Vision Institute, Paris, France
2003-2007: Directeur de Recherche INSERM, group leader, CNRS UMR7102, UPMC-Paris 6, Paris, France
1997-2002: Chargé de Recherche INSERM, INSERM U106, Salpêtriere Hospital, Paris, France
09/1991-12/1992: Research fellow, Montreal Neurological Institute, Canada.

Scientific Interests :

Research in my laboratory is focused on the development of neuronal networks in the vertebrate brain, with a specific interest in the molecular mechanisms controlling neuronal migration and axon guidance. We have mostly studied three models: the cerebellum, the retina and commissural neurons. During the last 10 years, we have focused on newly discovered axon guidance molecules, the netrins, the semaphorins, the RGMs and the Slits, all of which are phylogenetically conserved and expressed in many cell types outside the nervous system. We have contributed to the discovery of receptors for some of these proteins (neuropilin-2, A2b, L1 and neogenin). Most of our research is conducted in vivo using a variety of mouse models. My group currently analyzes the role of semaphorins, slits and their receptors in neuronal migration in the developing and adult CNS. We combine video-microscopy and biochemical methods to study several candidate downstream effectors
We have also designed a novel strategy based on a Robo3 conditional knockout which represents a unique and powerful genetic method to probe the precise functions of individual commissures and to identify the cellular substrate of related human neurological disorders.
We area developing novel molecular and imaging techniques to study the cellular mechanisms regulating cell-cell interactions during myelination, angiogenesis and ocular vaso-proliferative diseases. Last we are trying to understand how retinal layers are shaped during development.

Other Experiences and Professional Memberships :

1999-2003: Elected Member at the board of the French Society of Developmental Biology
2005-2009: Elected Member (Developmental Neurobiology) at the board of the French Neuroscience Society
2007-2009: Member of the scientific committee of the Fédération pour la Recherche sur le Cerveau (FRC)
2009-2011: Member of the scientific committee of the « Programme Blanc » of the Agence Nationale pour la Recherche (ANR)

2009: Member of the scientific committee of the « Programme Maladies Neurologiques et Psychiatriques» of the Agence Nationale
pour la Recherche (ANR)
2009-present: Member of the Scientific committee of the « Neuropole Recherche île de France (NeRF)
2009-present: Member of the Scientific committee « Grands Prix Ville de Paris et Appel à Projets »
2009-present: Scientific director of the animal facility of the Vision Institute
2009-present: Scientific director of the « imaging facility » of the Vision Institute
2009-present: Scientific director of the « imaging facility » of the IFR65 Paris-Saint Antoine
2007-present: Member of the Board of the « Paris School of Neurosciences (ENP)» (2007-)
2011-present: Member of the steering committee of the ED3C Doctoral School (UMPC University)
Editorial Boards
Development Growth and Differentiation (2007-), Plos One (2008-); Frontiers in Molecular Neurosciences (2009-), Journal of Neuroscience (2010-), Faculty of 1000 , Faculty member, Neurodevelopment (2010-).

Selected Peer-rewied Publications:

Zelina P.[1], Blockus H.[1], Zagar Y. [1], Péres A., Friocourt F., Wu Z., Rama N., Fouquet C., Hohenester E., Tessier-Lavigne M., Schweitzer J., Roest Crollius H. and Chédotal A.(2014) Positive selection and signaling switch of the axon guidance receptor Robo3 during vertebrate evolution. ***Neuron***, in press.

Delloye-Bourgeois C., Jacquier A., Charoy C., Reynaud F., Nawabi H., Thoinet K., Kindbeiter K., Yoshida Y., Zagar Y., Kong Y., Jones Y.E., Falk J., Chédotal A. and Castellani V. (2014) PlexinA1 is a novel Slit receptor and mediates bioactivity of Slit Cter fragments during axon guidance. ***Nature Neuroscience***, in press.

Chédotal A. (2014) Development and plasticity of commissural circuits : from locomotion to brain repair. ***Trends in Neuroscience*** 37, 551-562.

Gibson D.A., Tymanskyj S., Yuan R.C., Leung H.C., Lefebvre J.L., Sanes J.R., Chédotal A. and Ma L. (2014) Dendrite self-avoidance requires cell-autonomous slit/robo signaling in cerebellar Purkinje cells. ***Neuron*** 81, 1040-1056.

Belle M., Godefroy D., Dominici C., Heitz-Marchaland, C. Hellal F., Bradke F. and Chédotal A. (2014) A simple method for 3D analysis of immunolabeled axonal tracts in a transparent nervous system. ***Cell Reports*** 9, 1191-1201.

Badura, A., Schonewille, M., Voges, K., Galliano, E., Renier, N., Gao, Z., Witter, L., Hoebeek, F. E., Chédotal, A. and De Zeeuw, C. I. (2013) Climbing fiber input shapes reciprocity of Purkinje cell firing. ***Neuron*** 78: 700-13.

Michalski, N., Babai, N., Renier, N., Perkel, D. J., Chédotal, A. and Schneggenburger, R. (2013) Robo3-driven axon midline crossing conditions functional maturation of a large commissural synapse. ***Neuron*** 78: 855-68.

Matsuoka RL, Nguyen-Ba-Charvet K, Parray A, Badea TC, Chédotal A, Kolodkin AL (2011) Transmembrane Sema6A signaling through the PlexinA4 receptor controls lamina-specific neuronal connectivity in the vertebrate retina. ***Nature*** 470 :259-264.

Bouvier J, Thoby-Brisson M, Renier N, Dubreuil V, Ericson J, Champagnat J, Pierani A*, Chédotal A*, Fortin G* (2010) Hindbrain interneurons and axon guidance signaling critical for breathing. ***Nature Neuroscience*** 13 :1066-1074. * corresponding authors.

Renier N, Schonewille M, Giraudet F, Badura A, Tessier-Lavigne M, Avan P, De Zeeuw CI, Chédotal A (2010) Genetic dissection of the function of hindbrain axonal commissures. ***PLoS Biology*** 8:e1000325.

Geisen MJ, Di Meglio T, Pasqualetti M, Ducret S, Brunet JF, Chédotal A, Rijli FM (2008) Hox paralog group 2 genes control the migration of mouse pontine neurons through slit-robo signaling. ***PLoS Biology*** 6:e142.Renaud J, Kerjan G, Sumita I, Zagar Y, Georget V, Kim D,

Fouquet C, Suda K, Sanbo M, Suto F, Ackerman SL, Mitchell KJ, Fujisawa H, Chédotal A (2008) Plexin-A2 and its ligand, Sema6A, control nucleus-centrosome coupling in migrating granule cells. ***Nature Neuroscience*** 11:440-449.

Kerjan G, Dolan J, Haumaitre C, Schneider-Maunoury S, Fujisawa H, Mitchell KJ, Chédotal A (2005) The transmembrane semaphorin Sema6A controls cerebellar granule cell migration. ***Nature Neuroscience*** 8:1516-1524.

Marillat V, Sabatier C, Failli V, Matsunaga E, Sotelo C, Tessier-Lavigne M, Chédotal A (2004) The slit receptor Rig-1/Robo3 controls midline crossing by hindbrain precerebellar neurons and axons. ***Neuron*** 43:69-79.

Matsunaga E, Tauszig-Delamasure S, Monnier PP, Mueller BK, Strittmatter SM, Mehlen P, Chédotal A (2004) RGM and its receptor neogenin regulate neuronal survival. ***Nature Cell Biol*** 6:749-755.

Soussi-Yanicostas N, de Castro F, Julliard AK, Perfettini I, Chédotal A, Petit C (2002) Anosmin-1, defective in the X-linked form of Kallmann syndrome, promotes axonal branch formation from olfactory bulb output neurons. ***Cell*** 109:217-228.

Whitford KL, Marillat V, Stein E, Goodman CS, Tessier-Lavigne M, Chédotal A, Ghosh A (2002) Regulation of cortical dendrite development by Slit-Robo interactions. ***Neuron*** 33:47-61.

Chen H, Bagri A, Zupicich JA, Zou Y, Stoeckli E, Pleasure SJ, Lowenstein DH, Skarnes WC, Chédotal A*, Tessier-Lavigne M* (2000) Neuropilin-2 regulates the development of selective cranial and sensory nerves and hippocampal mossy fiber projections. ***Neuron*** 25:43-56. *Corresponding authors

Corset V, Nguyen-Ba-Charvet KT, Forcet C, Moyse E, Chédotal A, Mehlen P (2000) Netrin-1-mediated axon outgrowth and cAMP production requires interaction with adenosine A2b receptor. ***Nature*** 407:747-750.

Nguyen Ba-Charvet KT, Brose K, Marillat V, Kidd T, Goodman CS, Tessier-Lavigne M, Sotelo C, Chédotal A (1999) Slit2-Mediated chemorepulsion and collapse of developing forebrain axons. ***Neuron*** 22:463-473.