







PERSONAL DATA

Alexander Dityatev



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Sex M | Date of birth 20/01/1964 | Citizenship Russian Federation

EMPLOYMENT

From 2012	Full Professor, Head Molecular Neuroplasticity Group, German Center for Neurodegenerative Diseases (DZNE) Magdeburg, Germany
From 2012	Senior Consultant Department of Neuroscience and Brain Technologies Italian Institute of Technology Genova, Italy
From 2010	Invited Professor Laboratory for Brain Extracellular Matrix Research, University of Nizhny Novgorod Nizhny Novgorod, Russia
2007- 2012	Senior Researcher Group “Cell Adhesion and Synaptic Functions” Department of Neuroscience and Brain Technologies Italian Institute of Technology Genova, Italy
2008 – 2011	Contract Professor of Cell Biology Biotechnology Programme, University of Genova Genova, Italy
2006-2009	Affiliated Associate Professor Of Pharmacology Department of Pharmacal Sciences, Auburn University Alabama, USA
2004 – 2007	German Research Council (DFG) Fellow Institute for Neurophysiology and Pathophysiology, University Medical Center Hamburg – Eppendorf Hamburg, Germany
1998 – 2007	Leader of the Research Group “Recognition Molecules and Synaptic Plasticity”, Center for Molecular Neurobiology Hamburg, University Medical Center Hamburg-Eppendorf Hamburg, Germany
1992 – 1998	Postdoctoral Fellow Department of Physiology University of Bern Bern, Switzerland
1995 – 1996	Engineer, Senior Engineer, Junior Researcher Institute of Evolutionary Physiology and Biochemistry Russian Academy of Sciences Saint Petersburg Russian Academy of Sciences Saint Petersburg, Russia



EDUCATION AND DEGREES

1985 – 1991

PhD in Biology

Institute of Evolutionary Physiology and Biochemistry
Saint Petersburg Russian Academy of Sciences
Saint Petersburg, Russia

1998

MD in Mathematics

Chair of Statistical Modeling
Faculty of Mathematics and Mechanics
Leningrad State University
Saint Petersburg, Russia

ADDITIONAL INFORMATION

Scientific interests

Synaptogenesis; synaptic plasticity; cell adhesion; brain; spinal cord; extracellular matrix; ltp; ltd; recognition molecules; neurological disorders; psychiatric disorders; aging; excitatory synapse; inhibitory synapse; hippocampus; perineuronal net

Language skills

Russian (native), English (advanced)

Professional skills

Electrophysiology, neuropharmacology, patch-clamp electrophysiology, neurobiology, extracellular matrix, cell adhesion molecules, synaptogenesis, synaptic plasticity, synaptic transmission, physiology, all statistical tools

Scientometrics

Google Scholar: <http://scholar.google.ru/citations?user=Yvirj4AAAAAJ&hl=ru&oi=en>

Research Gate: http://www.researchgate.net/profile/Alexander_Dityatev/

ResearcherID: <http://www.researcherid.com/rid/A-4034-2008>

HONORS AND AWARDS

2010 - 2014

Invited Leading Scientist (by Russian Ministry of Science and Education)

2004 – 2007

German Research Council (DFG) Fellow

PROFESSIONAL
MEMBERSHIP AND SERVICE

Italian Society for Neuroscience
German Society for Neuroscience
IBRO
Society for Neuroscience
International Society for Matrix Biology

Editorial board member

Journal of Neurochemistry (from 2007)
Frontiers in Behavioral Neuroscience (2007)
Frontiers in Neuroengineering (from 2008)
Modern Technologies in Medicine (from 2011)

Reviewer for the following
journals and grants

Advances in Medical Sciences
BioTechniques
BMC Developmental Biology
Brain
Brain Research
Cellular and Molecular Neurobiology
European Journal of Neuroscience
Experimental Neurology
FEBS Letters
Frontiers in Bioscience
Frontiers in Behavioral Neuroscience
Frontiers in Neuroengineering
Hippocampus
Journal of Cellular Biochemistry

Journal of Functional Biomaterials
 Journal of Neurochemistry
 Journal of Neurophysiology
 Journal of Neuroscience Methods
 Journal of Neuroscience
 Journal of Neuroscience Research
 Learning and Memory
 Life Sciences
 Neural Plasticity
 Neurobiology of Disease
 Neurobiology of Learning and Memory
 Neurochemical Research
 Neurochemistry International
 Neuroparmacology
 Neuropsychopharmacology
 Neuroscience
 Neuroscience Letters
 Synaps

Alzheimer's Society
 The Estonian Science Foundation
 Health Research Council of New Zealand
 German Research Foundation (Deutsche Forschungsgemeinschaft)
 Medical Research Council of UK
 Project Seed (Italian Institute of Technology)
 The Wellcome Trust

Organization of international meetings

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- 2012 Chair, Second Conference of COST Action BM1001 „Brain ECM in health and disease“, Barcelona, Spain (FENS Satellite event).
 - 2011 Co-Chair, International Conference “Neuroimaging and Neurodynamics”, Nizhny Novgorod, Russia
 - 2011 Chair, First Conference of COST Action BM1001 „Brain ECM in health and disease“, Loano, Italy.
 - 2011 Co-chair, Workshop “Development and homeostatic control of synaptic function”, Fuessen, Germany.
 - 2011 Chair, IBRO-COST Workshop “Remodelling of neural extracellular matrix”, 8th IBRO World Congress of Neuroscience, Florence, Italy.
 - 2011 Co-chair, 16th European Carbohydrate Symposium, Sorrento, Italy.
 - 2011 Co-Chair, Symposium “Neural cell adhesion molecule NCAM and its post-translational modifications at the crossroad of signaling pathways and neural functions“, German Society for Neuroscience, Göttingen, Germany.
 - 2010 Programme Committee Member, International Meeting on Polysialic Acids, Potsdam, Germany.
 - 2010 Chair, International Symposium on Brain Extracellular Matrix, Nizhny Novgorod, Russia.
 - 2009 Co-Chair, Symposium “Extracellular matrix in neuronal plasticity and disease“. Congress of the Italian Society for Neuroscience. Milano, Italy.
 - 2009 Organizing committee member - Workshop “Frontiers in Cellular Neuroimaging 2005” RIKEN Brain Science Institute, Wako-shi, Saitama, Japan
 - 2009 Organizer - Research Symposium “Tonic GABA_A receptor mediated conductances: from receptor to neuronal circuitry” - Joint International Meeting of The Physiological Society & FEPS University of Bristol, UK
 - 2007 Co-Chair, Symposium “Cell adhesion molecules in formation of native and heterologous synapses“, IBRO, Melbourne, Australia.
 - 2007 Co-Chair, Symposium “Small GTPases as key players for morphogenic signalling in neurons“, International Neuroscience Winter Conference, Soelden, Austria.
 - 2006 Co-Chair, Symposium “Extracellular matrix molecules in formation and plasticity of central synapses“, FENS Forum, Vienna, Austria.

2005 Co-Chair, Symposium “Extracellular matrix in regeneration and synaptic plasticity”, German Society for Neuroscience, Göttingen, Germany.

TEACHING

Erasmus students

From 2003-2004

Adriana Stan

From 2003-2004

Luminita Stoenica

From 2004-2005

Tiberiu Stan

DAAD fellows

From 1998-1999

Dr. Jianrong Tang

From 2000-2002

Mu Sun

From 2004-2005

Luminita Stoenica

IIT summer fellowship students:

2009

Alexander Wirth

2009

Emanuel Costa

Tempus students

2010

Tatiana Kuznetsova

2011

Svetlana Korotchenko

GRANTS AND FINANCIAL SUPPORT

1994-1996

H.P. Clamann, A. Dityatev (CoPI), M. Antal. European Neuroscience Program in support of European Cooperation (Grant Nr. 192), "A correlative morphological and electrophysiological analysis of identified synaptic connections in the frog spinal cord".

2001-2003

A. Dityatev (PI). Deutsche Forschungsgemeinschaft. Di 702/1-1. "Mechanisms of synaptogenesis mediated by the neural cell adhesion molecule NCAM in the central nervous system of mice"

2002-2005

M. Schachner, A. Dityatev (CoPI). Research grant from Philip Morris Incorporated. "Nicotine and Recognition Molecules: Interplay during Hippocampal Development, Regeneration and Synaptic Plasticity"

2004-2006

G. Bruckner, A. Dityatev (CoPI), M. Schachner. SCHA 185/29-3 and 185/29-4. Deutsche Forschungsgemeinschaft. "The extracellular matrix of perineuronal nets: Dynamics of molecular organization and functional analysis".

2004-2006

A. Dityatev (PI). Di 702/4-1 and –2. Deutsche Forschungsgemeinschaft. "Mechanisms of synaptic plasticity mediated by extracellular matrix glycoproteins of the tenascin family".

2006-2007

G. Bruckner, A. Dityatev (CoPI) M. Schachner. Deutsche Forschungsgemeinschaft. "The extracellular matrix of perineuronal nets: Dynamics of molecular organization and functional analysis". SCHA 185/29-5.

2006-2007

A. Dityatev (PI). Deutsche Forschungsgemeinschaft. "Mechanisms of synaptic plasticity mediated by extracellular matrix glycoproteins of the tenascin family". 702/4-3.

2006-2009

C. Hübner, A. Dityatev (CoPI). Deutsche Forschungsgemeinschaft. „Functional analysis of neuronal anion exchangers using transgenic mouse models“

2009-.2012

A. Dityatev (PI). Compagnia di San Paolo, Neuroscience Grant “Fat times for neuronal plasticity: Mechanisms and significance of extracellular signal-regulated protein palmitoylation”

2010-2013

A. Dityatev (Local Coordinator). Tempus Project, „Postgraduate Training Network in Biotechnology of Neurosciences (BioN)“

2010-2014

A. Dityatev (Coordinator). COST Action 1001 “Brain extracellular matrix in health and disease (ECMNet).

2011-2014

H. Ehrenreich, J. Kuznicki, J. Nacher, E. Bock, G. Spalletta, A. Dityatev (CoPI), H. Hildebrandt, R. Gerardy-Schahn. European Research Projects on Mental Disorders (NEURON-Net). Novel strategies for the treatment of schizophrenia based on genetic variation of the neural cell adhesion molecule NCAM and enzymes involved in its posttranslational modifications (NeuConnect).

2010-2012

A. Dityatev (PI). Russian Ministry of Education and Science. The brain extracellular matrix as a determinant of intercellular communication and a target for therapeutic interventions.

2011-2014

C. Sala, A. Dityatev (CoPI), V. Broccoli, M. Giustetto. TELETHON. Identification of neuronal alterations underlying 22q13 deletion syndrome and their rescue by genetic/pharmacological therapies in animal models and patients' derived iPS cells.

V. Broccoli, A. Dityatev (CoPI), R. Gainetdinov. The Michael J. Fox Foundation for Parkinson's Research. Assessing the therapeutic potential of iDA neuronal cells in an

autologous transplantation strategy.

SELECTED PEER-REVIEWED PUBLICATIONS

1. Dityatev A., Dityateva G., and Schachner M. (2000) Synaptic strength as a function of post-versus presynaptic expression of the neural cell adhesion molecule NCAM. **Neuron** 26: 207-217.
2. Dityatev A., Dityateva G., Sytnyk V., Delling M., Toni N., Nikonenko I., Muller D., and Schachner M. (2004) Polysialylated neural cell adhesion molecule PSA-NCAM promotes formation and remodeling of hippocampal synapses. **J. Neurosci.**24: 9372-9382.
3. Senkov O., Sun M., Weinhold B., Gerardy-Schahn R., Schachner M., and Dityatev A. (2006) Polysialylated NCAM is involved in induction of long-term potentiation and memory acquisition and consolidation in a fear conditioning paradigm. **J. Neurosci.**26:10888-10898.
4. Bukalo O., Schachner M. and Dityatev A.(2007) Hippocampal metaplasticity induced by deficiency in the extracellular matrix glycoprotein tenascin-R. **J. Neurosci.**27: 6019-6028.
5. Ponimaskin E., Dityateva G., Ruonala M.O., Fukata M.,Fukata Y., Kobe F., Wouters F.S., Delling M., Bredt D.S., Schachner M., Dityatev A. (2008) Fibroblast growth factor-regulated palmitoylation of NCAM determines neuronal morphogenesis. **J. Neurosci.**28:8897-8907. Highlight: This week in the Journal: FGF2 Causes NCAM Palmitoylation, J. Neurosci.28:i
6. Kochlamazashvili G., Senkov O., Grebenyuk S., Sims C., Xiao M., Stummeyer K., Gerardy-Schahn R., Engel A.K., Feig L., Semyanov A., Suppiramaniam V., Schachner M., Dityatev A. (2010) NCAM-associated polysialic acid regulates synaptic plasticity and learning by restraining the signaling through GluN2B-containing NMDA receptors. **J. Neurosci** 30:4171-4183.Highlight: Senkov O. The dark matter of the brain: schizophrenia. V mire nauki (a Russian version of Scientific American), May 2010, P 46-55.
7. Kochlamazashvili G., Bukalo O., Henneberger C., Dvoretzkova E., Senkov O., Lievens P.M.-J., Westenbroek R., Engel A.K., Catterall W.A., Rusakov D.A., Schachner M., Dityatev A. (2010) The extracellular matrix molecule hyaluronic acid regulates hippocampal synaptic plasticity by modulating postsynaptic L-type Ca²⁺ channels. **Neuron** 67:116-128. Highlights: on the cover of Neuron issue of July 15, 2010. 15 press releases in Italy and 1 in Germany.
8. Dityatev A., Schachner M., and Sonderegger P. (2010) The dual role of the extracellular matrix in synaptic plasticity and homeostasis. **Nat. Rev. Neurosci.**11:735-746.Highlights: 7 press releases in Italy.
9. Caiazzo M., Dell'Anno M.T., Dvoretzkova E., Lazarevic D., Taverna S., Leo D., Sotnikova T.D., Menegon A., Roncaglia P., Colciago G., Russo G., Carninci P., Pezzoli G., Gainetdinov R.R., Gustincich S., Dityatev A*, Broccoli V*. (2011) Direct generation of functional dopaminergic neurons from mouse and human fibroblasts. **Nature** 476:224-227. *Co-senior authors. Highlights: >30 press releases worldwide.
10. Kochlamazashvili G., Bukalo O., Senkov O., Salmen B., Gerardy-Schahn R., Engel A.K., Schachner M., and Dityatev A.(2012) Restoration of synaptic plasticity and learning in young and adult NCAM deficient mice by enhancing neurotransmission mediated by the NR2A-containing NMDA receptors. **J. Neurosci.** 32:2263–2275. Highlight: on the cover of February 15, 2012 issue of J. Neurosci.

FULL LIST OF PUBLICATIONS

Research papers in refereed journals

1. Bart A.G., **Dityatev A.E.**, and Kozhanov V.M. (1988) Quantal analysis of the postsynaptic potentials at the interneuronal synapses: Recovery of a signal from the noise. *Neurophysiology* 20: 479-487.
2. Bart A.G., **Dityatev A.E.**, and Kozhanov V.M. (1988) Analysis of the transmission at the interneuronal synapses by the convolution of binomial distributions. *Neurophysiology* 20: 487-494.
3. Chebotareva M.A., and **Dityatev A.E.** (1988) Brain cholesterol at representatives of various classes of vertebrates. *Zh. Evol. Biokhim. Fiziol.* 24: 426-431.
4. Bart A.G., **Dityatev A.E.**, and Kozhanov V.M. (1989) Analysis of signal transmission at the interneuronal synapses on the basis of reflections principle. *Doklady Akademii Nauk SSSR (Physiology)* 306: 1503-1507.
5. **Dityatev A.E.** (1989) Analysis of the functional heterogeneity of the sensory-motor synapse. *Neurophysiology* 21: 780-788.
6. Meyer M.N., and **Dityatev A.E.** (1989) Linear discriminant analysis used to diagnose sibling species of a common vole (*Rodentia, Microtus*). *Zoologicheskii J.* 68: 119-129.

7. Berman A.L., **Dityatev A.E.**, and Frishman D.I. (1990) Physico-chemical properties of signal receptor domains as the basis for sequence comparison. *Comp. Biochem. Physiol.* 98B: 445-449.
8. Kharchenko E.P., and **Dityatev A.E.** (1991) Prediction of antigenic peptide sequences recognized by the major histocompatibility complex. *Doklady Akademii Nauk SSSR (Immunology)* 308: 1013-1016.
9. **Dityatev A.E.**, Kozhanov V.M., and Gaponovich S.O. (1992) Modeling of the quantal release at interneuronal synapses: Analysis of permissible values of model moments. *J. Neurosci. Meth.* 43: 201-214.
10. **Dityatev A.E.**, Batueva I.V., and Kozhanov V.M. (1992) Directions of postsynaptic potential amplitude stabilization at interneuronal synapses of vertebrates. *Zh. Evol. Biokhim. Fiziol.* 28: 232-239.
11. Pinchuk N.M., Grishman Z.M., **Dityatev A.E.**, Evdokimov I.I., Levchenko V.F., and Menshutkin B.B. (1992) Analysis, simulation and prediction of ecological situation in the Neva bay and eastern part of the gulf of Finland. *Physiol. Cheloveka* 18: 131-135.
12. Radchenko I.V., **Dityatev A.E.**, Batrak G.N., and Luik A.I. (1993) Ligand-receptor interactions. Multidimensional mathematical analysis. *Ukrainian Biochem. J.* 65: 11-24.
13. **Dityatev A.E.**, and Clamann H.P. (1993) Limits of quantal analysis reliability: unimodal constraints and setting of confidence intervals for quantal size. *J. Neurosci. Meth.* 50: 67-82.
14. **Dityatev A.E.**, Kozhanov V.M., Gapanovich S.O., and Clamann H.P. (1994) Quantal analysis based on spectral methods. *Pflugers Arch.* 429: 22-26.
15. **Dityatev A.E.**, Chmykhova N.M., Studer L., Karamian O.A., Kozhanov V.M., and Clamann H.P. (1995) Comparison of the topology and growth rules of motoneuronal dendrites. *J. Comp. Neurol.* 363: 503-516.
16. **Dityatev A.E.**, and Clamann H.P. (1996) Reliability of spike propagation in arborisations of dorsal root fibers studied by analysis of postsynaptic potentials mediated by electrotonic coupling in the frog spinal cord. *J. Neurophysiol.* 76: 3451-3459.
17. Vogt K., Streit J., **Dityatev A.E.**, and Lüscher H.-R. (1997) Synaptic plasticity in dissociated hippocampal cultures: pre- and postsynaptic contributions. *J. Eur. Neurosci.* 9: 1078-1082.
18. Van Pelt J., **Dityatev A.E.**, and Uylings H.B.M. (1997) Natural variability in the number of dendritic segments: model-based inferences about branching during neurite outgrowth. *J. Comp. Neurol.* 387: 325-340.
19. Larkum M.E., Launey T., **Dityatev A.**, and H.-R.Lüscher (1998) Integration of excitatory postsynaptic potentials in dendrites of motoneurons of rat spinal cord slice cultures. *J. Neurophysiol.* 80: 924-935.
20. Thiel G., and **Dityatev A.E.** (1998) Transient activity of excitatory Cl⁻ channels in *Chara*: evidence for quantal release of a gating factor. *J. Membrane Biol.* 163: 183-191.
21. **Dityatev A.E.**, and Clamann H.P. (1998) Synaptic differentiation of single descending fibers studied by triple intracellular recording in the frog spinal cord. *J. Neurophysiol.* 79: 763-768.
22. Saghatelian A.K., Gorissen S., Albert M., Hertlein B., Schachner M., and **Dityatev A.** (2000) The extracellular matrix molecule tenascin-R and its HNK-1 carbohydrate modulate perisomatic inhibition and long-term potentiation in the CA1 region of the hippocampus. *Eur. J. Neurosci.* 12: 3331-3342.
23. Eckhardt M., Bukalo O., Chazal G., Wang L., Goridis C., Schachner M., Gerardy-Schahn R., Cremer H., and **Dityatev A.** (2000) Mice deficient in the polysialyltransferase ST8SialIV allow discrimination of the roles of neural cell adhesion molecule protein and polysialic acid in neural development and synaptic plasticity. *J. Neurosci.* 20: 5234-5244.
24. **Dityatev A.**, Dityateva G., and Schachner M. (2000) Synaptic strength as a function of post- versus presynaptic expression of the neural cell adhesion molecule NCAM. *Neuron* 26: 207-217.
25. Tang J., Wotjak C., Wagner S., Williams G., Schachner M., and **Dityatev A.** (2001) Potentiated auditory-evoked potentials and

- freezing behavior show differences in extinction after fear conditioning in mice. *Brain Research* 919: 232-241.
26. Bukalo O., Schachner M., and **Dityatev A.** (2001) Modification of extracellular matrix by enzymatic removal of chondroitin sulfate and by lack of tenascin-R differentially affects several forms of synaptic plasticity in the hippocampus. *Neuroscience* 104: 359-369.
27. Sytnyk V.N., **Dityatev A.E.**, and Korogod S.M. (2001a) Distribution of cell adhesion molecules (CAMs) along the branching neurite surface: model inherited effects of the branch diameter and mode of CAM transport. *Neurophysiology* 33: 15-19.
28. Sytnyk V. N., Korogod S. M., and **Dityatev A.E.** (2001b) Diffusion and active transport of NCAM within the neuronal plasma membrane. *Neurophysiology* 33: 140-147.
29. Saghatelian A.K., **Dityatev A.**, Schmidt S., Schuster T., Bartsch U., and Schachner M. (2001) Reduced perisomatic inhibition, increased excitatory transmission and impaired long-term potentiation in mice deficient for the extracellular matrix glycoprotein tenascin-R. *Mol. Cell. Neurosci.* 17: 226-240.
30. **Dityatev A.E.**, Birinyi A., Puskár Z., Antal M., and Clamann H.P. (2001a) Monosynaptically connected long propriospinal axon - motoneuron pairs in the lumbar spinal cord of frogs. A correlative physiological and morphological study. *Neuroscience* 106: 405 – 417.
31. **Dityatev A.E.**, Chmykhova N.M., Dityateva G.V., Babalian A.L., Kleinle J., and Clamann H.P. (2001b) Structural and physiological properties of synapses formed by individual reticulospinal fibers on lumbar motoneurons of the frog. *J. Comp. Neurol.* 430: 433-447.
32. Sytnyk V., Leshchyn'ska I., Delling M., Dityateva G., **Dityatev A.**, and Schachner M. (2002) NCAM promotes accumulation of trans-Golgi network organelles at sites of neuron-to-neuron contacts. *J. Cell Biol.* 159: 649-661. Highlights: Dole A.W. (2002) Selecting synapse start sites. *J. Cell. Biol.* 159: 537; Smallridge R. (2003) Making new synapses. *Nat. Rev. Mol. Cell. Biol.* 4: 6-7.
33. Strekalova T., Sun M., Sibbe M., Evers M., **Dityatev A.**, Gass P., and Schachner M. (2002) Fibronectin domains of extracellular matrix molecule tenascin-C modulate hippocampal learning and synaptic plasticity. *Mol. Cell. Neurosci.* 21: 173-187.
34. Delling M., Wischmeyer E., **Dityatev A.**, Veh R., Karschin A., and Schachner M. (2002) The neural cell adhesion molecule NCAM regulates cell surface delivery of G protein-activated inwardly rectifying potassium channels via lipid rafts. *J. Neurosci.* 22: 7154-7164. Highlight: Wood H. (2002) A raft of possibilities. *Nat. Rev. Neurosci.* 3: 762-763.
35. Evers M.R., Salmen B., Bukalo O., Rollenhagen A., Bösl M.R., Morellini F., Bartsch U., **Dityatev A.**, and Schachner M. (2002) Impairment of L-type Ca²⁺ channel-dependent forms of hippocampal synaptic plasticity in mice deficient in the extracellular matrix glycoprotein tenascin-C. *J. Neurosci.* 22: 7177-7194.
36. Niethammer P., Delling M., Sytnyk V., **Dityatev A.**, Fukami K., and Schachner M. (2002) Co-signaling via lipid raft associated kinases and the FGF receptor is required for NCAM-mediated neuritogenesis. *J. Cell Biol.* 157: 521-532.
37. Tang J., Wagner S., Schachner M., **Dityatev A.**, and Wotjak C.T. (2003) Potentiation of amygdaloid and hippocampal auditory evoked potentials in a discriminatory fear-conditioning task as a function of tone pattern and context. *Eur. J. Neurosci.* 18: 639-650.
38. Saghatelian A.K., Snapyan M., Gorissen S., Meigel I., Mosbacher J., Kaupmann K., Bettler B., Kornilov A.V., Nifantiev N.E., Sakanyan V., Schachner M., and **Dityatev A.** (2003) Recognition molecule-associated carbohydrate inhibits postsynaptic GABAB receptors: A mechanism for homeostatic regulation of GABA release in perisomatic synapses. *Mol. Cell. Neurosci.* 24: 271-282.
39. Dityateva G., Hammond M., Thiel C., Ruonala M.O., Delling M., Siebenkotten G., Nix M., and **Dityatev A.** (2003) Rapid and efficient electroporation-based gene transfer into primary dissociated neurons. *J. Neurosci. Methods* 130: 65-73. Highlight: K. Brandau (2004) Auch Neuronen lassen sich transfizieren. *Laborjournal* 1-2/2004: 37.
40. Law J. W. S., Lee A. Y. W., Mu S., Nikonenko A. G., Chung S. K., **Dityatev A.**, Schachner M., and Morellini F. (2003) Decreased anxiety, altered place learning and increased CA1 basal excitatory synaptic transmission in mice with conditional ablation of the neural cell adhesion molecule L1. *J. Neurosci.* 23: 10419-10432.

41. Fux C.M., Krug M., **Dityatev A.**, Schuster T., and Schachner M. (2003) NCAM180 and glutamate receptor subunits in potentiated spine synapses: an immunogold electron microscopic study. *Mol. Cell. Neurosci.* 24: 931-942.
42. Bukalo O., Fentrop N., Lee A., Salmen B., Law J.W.S., Wotjak C.T., Schweizer M., **Dityatev A.**, and Schachner M. (2004) Conditional ablation of the neural cell adhesion molecule NCAM reduces precision of spatial learning, long-term potentiation and depression in the CA1 subfield of mouse hippocampus. *J. Neurosci.* 24: 1565-1577.
43. Brenneke F., Bukalo O., **Dityatev A.**, and Lie A.A. (2004) Mice deficient for the extracellular matrix glycoprotein tenascin-R show physiological and structural hallmarks of increased hippocampal excitability, but no increased susceptibility to seizures in the pilocarpine model of epilepsy. *Neuroscience* 124: 841-855.
44. Saghatelian A.K., Nikonenko A., Sun M., Rolf B., Dityateva G., Putthoff P., Bartsch U., Kutsche M., **Dityatev A.**, and Schachner M. (2004) Reduced GABAergic transmission and number of hippocampal perisomatic inhibitory synapses in juvenile mice deficient in the neural cell adhesion molecule L1. *Mol. Cell. Neurosci.* 26: 191-203.
45. Angata K., Long J.M., Bukalo O., Lee W., **Dityatev A.**, Wynshaw-Boris A., Schachner M., Fukuda M., and Marth J.D. (2004) Sialyltransferase ST8Sia-II assembles a distinct repertoire of polysialic acid that alters hippocampal axonal targeting and promotes fear behavior. *J. Biol. Chem.* 279: 32603-32613.
46. Vaithianathan T., Matthias K., Mu S., Bahr B., Schachner M., Suppiramaniam V., **Dityatev A.**, and Steinhäuser C. (2004) Neural cell adhesion molecule associated polysialic acid potentiates AMPA receptor-mediated currents. *J. Biol. Chem.* 279: 47975-47984.
47. **Dityatev A.**, Dityateva G., Sytnyk V., Delling M., Toni N., Nikonenko I., Muller D., and Schachner M. (2004) Polysialylated neural cell adhesion molecule PSA-NCAM promotes formation and remodeling of hippocampal synapses. *J. Neurosci.* 24: 9372-9382.
48. Vaithianathan T., Manivannan K., Kleene K., Dey M., **Dityatev A.**, and Suppiramaniam V. (2005) Single channel recordings from mossy fiber synaptosomal AMPA receptors. *Cell. Biochem. Biophys.* 42: 75-85.
49. Richard I., Ader M., Sytnyk V., **Dityatev A.**, Richard G., Schachner M., and Bartsch U. (2005) Efficient transfection of neural stem cells by electroporation. *Mol. Brain Res.* 138:182-190.
50. Kvachnina E., Liu G., **Dityatev A.**, Renner U., Dumuis A., Richter D.W., Dityateva G., Schachner M., Voyno-Yasenetskaya T.A. and Ponimaskin E.G. (2005) 5-Hydroxytryptamine(7) receptor is coupled to G α subunits of heterotrimeric G12 protein to regulate gene transcription and neuronal morphology. *J. Neurosci.* 25: 7821-7830.
51. Nikonenko A.G., Sun M., Lepsveridze M., Apostolova I., Petrova I., Irintchev A., **Dityatev A.**, and Schachner M. (2006) Enhanced perisomatic inhibition and impaired long-term potentiation in the CA1 region of juvenile CHL1 deficient mice. *Eur. J. Neurosci.* 23: 1839-1852.
52. Stoenica L., Senkov O., Weinhold B., Gerardy-Schahn R., Schachner M., and **Dityatev A.** (2006) *In vivo* synaptic plasticity in the dentate gyrus of mice deficient in the neural cell adhesion molecule NCAM or its polysialic acid. *Eur. J. Neurosci.* 23: 2255-2264.
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Patent

- A. Dityatev**, E. Dvoretzkova, C.Sala, C.Verpelli Italian Patent TO2011A00169 Modulatore allostereici positivi di mGluR5 per l'impiego nel trattamento terapeutico della sindrome di Phelan-McDermid, filed on 28nd February 2011. WO/2 012/117334, International Application No.: PCT/IB2 012/050894 MGLuR5 positive allosteric modulators for use in the treatment of Phelan-McDermid syndrome, International Filing Date: 27.02.2012.