Isolation of cells from brain and spinal cord – a bibliography

The methodology for the isolation various types of neural cell (motoneurons and neuroglial cells) from brain and spinal cord using OptiPrep™ is well-established and presented in detail in the OptiPrep™ Application Sheets that can be found on the Applications flash-drive or accessed via the following website www.axis-shield-density-gradient-media.com (click on "Methodology then "Mammalian and non-mammalian cells" and follow the links from the Index).

- Application Sheet C22: Motoneurons from spinal cords
- Application Sheet C29: Motoneurons from brain
- Application Sheet C36: Microglial cells

This Mini-Review brings together all of the known published papers reporting the use of OptiPrep™ for neural cells. The references are presented alphabetically according to animal and tissue source (e.g. Mouse brain cortex (adult)) and, where necessary, divided further into research topic areas. Within each section references are listed alphabetically according to first author and the title of each paper is highlighted in *blue text*.

1. Methodology

The following references provides detailed methodologies for the isolation and culture of motoneurons using gradients prepared from OptiPrep™:

Brinn, M., O'Neill, K., Musgrave, I., Freeman, B.J.C., Henneberg, M. and Kumaratilake, J. (2016) *An optimized method for obtaining adult rat spinal cord motorneurons to be used for tissue culture* J. Neurosci., Meth., **273**, 128–137

Brewer, G.J. and Torricelli, J.R. (2007) *Isolation and culture of adult neurons and neurospheres* Nat. Protoc., **2**, 1490-1498

Graber, D.J. and Harris, B.T. (2013) *Purification and culture of spinal motor neurons* Cold Spring Harb. Protoc., prot074161, pp 319-326

Price, P.J. and Brewer, G.J. (2001) *G Serum-free media for neural cell cultures, adult and embryonic* In Protocols for Neural Cell CultureJ. Physiol., **535**, 663-677 (Ed. Federoff, S. and Richardson, A.) Humana Press,

Southam, K.A., King, A.E., Blizzard, C.A., McCormack, G.H. and Dickson, T.C. (2015) *A novel in vitro primary culture model of the lower motor neuron–neuromuscular junction circuit* In Neuromethods, **103**, Microfluidic and Compartmentalized Platforms for Neurobiological Research (ed. Biffi, E.) Springer Science+Business Media New York, pp 181-193, Totowa, N.J., USA pp 255-264

2. Motoneurons

Chicken embryo spinal cord

Macosko, J.C., Newbern, J.M., Rockford, J., Chisena, E.N., Brown, C.M., Holzwarth, G.M. and Milligan, C.E. (2008) *Fewer active motors per vesicle may explain slowed vesicle transport in chick motoneurons after three days in vitro* Brain Res., **1211**, 6-12

Newbern, J., Taylor, A., Robinson, M., Li, L. and Milligan, C.E. (2005) *Decreases in phosphoinositide-3-kinase/Akt and extracellular signal-regulated kinase 1/2 signaling activate components of spinal motoneuron death* J. Neurochem., **94**, 1652-1665

Newbern, J., Taylor, A., Robinson, M., Lively, M.O. and Milligan, C.E. (2007) *c-Jun N-terminal kinase signaling regulates events associated with both health and degeneration in motoneurons* Neuroscience, **147**, 68-692

Robinson, M.B., Taylor, A.R., Gifondorwa, D.J., Tytell, M. and Milligan, C.E. (2008) *Exogenous Hsc70, but not thermal preconditioning, confers protection to motoneurons subjected to oxidative stress* Develop. Neurobiol., **68**, 1-17

Taylor, A.R., Gifondorwa, D.J., Newbern, J.M., Robinson, M.B., Strupe, J.L., Prevette, D., Oppenhiem, R.W. and Milligan, C.E. (2007) *Astrocyte and muscle-derived secreted factors differentially regulate motoneuron survival* J. Neurosci., **27**, 634-644

Taylor, A.R., Robinson, M.B. and Milligan, C.E. (2007) *In vitro methods to prepare astrocyte and motoneuron cultures for the investigation of potential in vivo interactions* Nat. Protoc., **2**, 1499-1507

Taylor, A.R., Gifondorwa, D.J., Robinson, M.B., Strupe, J.L., Prevette, D., Johnson, J.E., Hempstead, B., Oppenheim, R.W. and Milligan, C.E. (2012) *Motoneuron programmed cell death in response to ProBDNF* Develop. Neurobiol., **72**, 699–712

Fish

Da Silva, C.A., de Morais, E.C.P., Costa, M.D.M, Ribas, J.L.C., Guiloski, I.C., Ramsdorf, W.A., Zanata, S.M., Cestari, M.M., Ribeiro, C.A.O., Magalhães, V.F., Trudeau, V.L., de Assis, H.C.S. (2014) *Saxitoxins induce cytotoxicity, genotoxicity and oxidative stress in teleost neurons in vitro* Toxicon, **86**, 8–15

Freshwater turtle

Cocilova, C.C. and Milton, S.L. (2016) *Characterization of brevetoxin (PbTx-3) exposure in neurons of theanoxia-tolerant freshwater turtle (Trachemys scripta)* Aquat. Toxicol., **180**, 115–122

Hamster brain cortex

Hollister, J.R., Lee, K.S., Dorward, D.W. and Baron, G.S. (2015) *Efficient uptake and dissemination of scrapie prion protein by astrocytes and fibroblasts from adult hamster brain* PLoS One, **10**: e0115351Magalhaes, A.C., Baron, G.S., Lee, K.S., Steele-Mortimer, O., Dorward, D., Prado, M.A.M. and Caughey, B. (2005) *Uptake and neuritic transport of scrapie prion protein coincident with infection of neuronal cells* J. Neurosci., **25**, 5207-5216

Human brain cortex (at autopsy)

Konishi, Y., Lindhilm, K., Yang, L-B., Li, R. and Shen, Y. (2002) *Isolation of living neurons from human elderly brains using the immunomagnetic sorting DNA-linker system* Am. J. Pathol., **161**, 1567-1576

Human brain cortex (ex-surgery)

Brewer, G.J., Espinosa, J., McIlhaney, M.P., Pencek, T.P., Kesslak, J.P., Cotman, C., Viel, J. and McManus, D.C. (2001) *Culture and regeneration of human neurons after brain surgery* J. Neurosci Meth., **107**, 15-23

Gibbons, H.M. and Dragunow, M. (2010) *Adult human brain cell culture for neuroscience research* Int. J. Biochem. Cell Biol., **42**, 844–856

Human embryonic spinal cord

Sundaramoorthy, V., Walker, A.K., Tan, V., Fifita, J.A., Mccann, E.P., Williams, K.L., Blair, I.P., Guillemin, G.J., Farg, M.A. and Atkin, J.D. (2015) *Defects in optineurin- and myosin VI-mediated cellular trafficking in amyotrophic lateral sclerosis* Hum. Mol. Genet., **24**, 3830–3846

Mouse brain amygdala

Mou, L., Dias, B.G. Gosnell, H. and Ressler, K.J. (2013) *Gephryin plays a key role in BDNF-dependent regulation of amygdala surface $GABA_A$RS* Neuroscience **255**, 33–44

Mouse brain cerebellar granule

Benson, M.D., Romero, M.I., Lush, M.E., Lu, R., Henkemeyer, M. and Parada, L.F. (2005) *Ephrin-B3 is a myelin-based inhibitor of neurite outgrowth* Proc. Natl. Acad. Sci. USA, **102**, 10694-10699

Davis, T.H., Chen, C. and Isom, L.L. (2004) *Sodium channels β1 subunits promote neurite outgrowth in cerebellar granule neurons* J. Biol. Chem., **279**, 51424-51432

Sharkey, L.M., Cheng, X., Drews, V., Buchner, D.A., Jones, J.M., Justice, M.J., Waxman, S.G., Dib-Hajj, S.D. Meisler, M.H. (2009) *The ataxia3 mutation in the N-terminal cytoplasmic domain of sodium channel Nav1.6 disrupts intracellular trafficking* J. Neurosci., **29**, 2733–2741

Mouse brain cortex (adult)

Barsukova, A., Komarov, A., Hajnoczky, G., Bernardi, P., Bourdette, D. and Forte, M. (2011) *Activation of the mitochondrial permeability transition pore modulates Ca^{2+} responses to physiological stimuli in adult neurons* Eur. J, Neurosci., **33**, 831–842

Barsukova, A.G., Bourdette, D. and Forte, M. (2011) *Mitochondrial calcium and its regulation in neurodegeneration induced by oxidative stress* Eur. J. Neurosci., **34**, 437–447

Barsukova, A.G., Forte, M. and Bourdette, D. (2012) *Focal increases of axoplasmic Ca^{2+}, aggregation of sodium–calcium exchanger, N-type Ca^{2+} channel, and actin define the sites of spheroids in axons undergoing oxidative stress* J. Neurosci., **32**, 12028 –12037

Benson, M.D., Romero, M.I., Lush, M.E., Lu, R., Henkemeyer, M. and Parada, L.F. (2005) *Ephrin-B3 is a myelin-based inhibitor of neurite outgrowth* Proc. Natl. Acad. Sci. USA, **102**, 10694-10699

Cao, L., Pu, J., Scott, R.H., Ching, J. and McCaig, C.D. (2015) *Physiological electrical signals promote chain migration of neuroblasts by up-regulating P2Y1 purinergic receptors and enhancing cell adhesion* Stem Cell Rev. Rep., **11**, 75−86
Ghosh, D., LeVault, K.R., Barnett, A.J. and Brewer, G.J. (2012) *A reversible early oxidized redox state that precedes macromolecular ROS damage in aging nontransgenic and 3xTg-AD mouse neurons* J. Neurosci., **32**, 5821–5832
Ghosh, D., LeVault, K.R. and Brewer, G.J. (2014) *Dual-energy precursor and nuclear erythroiderelated factor 2 activator treatment additively improve redox glutathione levels and neuron survival in aging and Alzheimer mouse neurons upstream of reactive oxygen species* Neurobiol. Aging, **35**, 179-190
Leon, J., Sakumi, K., Castillo, E., Sheng, Z., Oka, S. and Nakabeppu, Y. (2016) *8-Oxoguanine accumulation in mitochondrial DNA causes mitochondrial dysfunction and impairs neuritogenesis in cultured adult mouse cortical neurons under oxidative conditions* Sci. Rep., **6**: 22086
Li, S., Nie, E.H., Yin, Y., Benowitz, L.I., Tung, S., Vinters, H.V., Bahjat, F.R., Stenzel-Poore, M.P., Kawaguchi, R., Coppola, G. and Carmichael, S.T. (2015) *GDF10 is a signal for axonal sprouting and functional recovery after stroke* Nat. Neurosci., **18**, 1737-1745
Lopez, J.R., Lyckman, A., Oddo, S., LaFerla, F.M., Querfurth, H.W., Shtifman, A. (2008) *Increased intraneuronal resting [Ca^{2+}] in adult Alzheimer's disease mice* J. Neurochem., **105**, 262-271
Magalhaes, A.C., Baron, G.S., Lee, K.S., Steele-Mortimer, O., Dorward, D., Prado, M.A.M. and Caughey, B. (2005) *Uptake and neuritic transport of scrapie prion protein coincident with infection of neuronal cells* J. Neurosci., **25**, 5207-5216
Nathan, B.P., Jiang, Y., Wong, G.K., Shen, F., Brewer, G.J. and Struble, R.G. (2002) *Apolipoprotein E4 inhibits, and apolipoprotein E3 promotes neurite outgrowth in cultured adult mouse cortical neurons through the low-density lipoprotein receptor-related protein* Brain Res., **928**, 96-105
Nathan, B.P., Barsukova, A.G., Shen, F., McAsey, M. and Struble, R.G. (2004) *Estrogen facilitates neurite extension via apolipoprotein E in cultured adult mouse cortical neurons* Endocrinology, **145**, 3065-3073
Nicoll, M.P., Hann, W., Shivkumar, M., Harman, L.E.R., Connor, V., Coleman, H.M., Proença, J.T. and Efstathiou, S. (2016) *The HSV-1 latency-associated transcript functions to repress latent phase lytic gene expression and suppress virus reactivation from latently infected neurons* PLoS Pathog., **12**: e1005539
Tiwari, M., Lopez-Cruzan, M., Morgan, W.W. and Herman, B. (2011) *Loss of caspase-2-dependent apoptosis induces autophagy after mitochondrial oxidative stress in primary cultures of young adult cortical neurons* J. Biol. Chem., **286**, 8493–8506
Wils, H., Kleinberger, G., Janssens, J., Pereson, S., Joris, G., Cuijt, I., Smits, V., Ceuterick-de Groote, C., Van Broeckhoven, C., and Kumar-Singh, S. (2010) *TDP-43 transgenic mice develop spastic paralysis and neuronal inclusions characteristic of ALS and frontotemporal lobar degeneration* Proc. Natl. Acad. Sci. USA, **107**, 3858–3863
Xu, Y-h., Xu, K., Sun, Y., Liou, B., Quinn, B., Li, R-h., Xue, L., Zhang, W., Setchel, K.D.R., Witte, D. and Grabowski, G.A. (2014) *Multiple pathogenic proteins implicated in neuronopathic Gaucher disease mice* Hum. Mol. Genet., **23**, 3943–3957

Mouse brain cortex (juvenile)

Osada, K., Tamamaki, N., Song, S-Y., Kakazu, N., Yamazaki, Y., Makino, H., Sasaki, A., Hirayama, T., Hamada, S., Nave, K-A. and Yanagimachi, R. (2005) *Developmental pluripotency of the nuclei of neurons in the cerebral cortex of juvenile mice* J. Neurosci., **25**, 8368-8374
Wang, Y-J., Wang, X., Lu, J-J., Li, Q-X.,Gao, C-Y., Liu, X-H., Sun, Y., Yang, M., Lim, Y., Evin, G., Zhong, J-H., Masters, C. and Zhou, X-F. (2011) *p75NTR regulates Aβ deposition by increasing Aβ production but inhibiting Aβ aggregation with its extracellular domain* J. Neurosci., **31**, 2292–2304

Mouse brain cortex (neo-natal)

Tang, Z., Arjunan, P., Lee, C., Li, Y., Kumar, A., Hou, X., Wang, B., Wardega, P., Zhang, F., Dong, L., Zhang, Y., Zhang, S-Z., Ding, H., Fariss, R.N., Becker, K.G., Lennartsson, J., Nagai, N., Cao, Y. and Li, X. (2010) *Survival effect of PDGF-CC rescues neurons from apoptosis in both brain and retina by regulating GSK3β phosphorylation* J. Exp. Med., **207**, 867-880

Mouse brain cortex (post-natal)

Ahmed, A.I., Shtaya, A.B., Zaben, M.J., Owens, E.V., Kiecker, C. and Gray, W.P. (2012) *Endogenous GFAP-positive neural stem/progenitor cells in the postnatal mouse cortex are activated following traumatic brain injury* J. Neurotrauma, **29**, 828–842
Barsukova, A.G., Forte, M. and Bourdette, D. (2012) *Focal increases of axoplasmic Ca^{2+}, aggregation of sodium–calcium exchanger, N-type Ca^{2+} channel, and actin define the sites of spheroids in axons undergoing oxidative stress* J. Neurosci., **32**, 12028 –12037

Berretta, A., Gowing, E.K., Jasoni, C.L. and Clarkson, A.N. (2016) *Sonic hedgehog stimulates neurite outgrowth in a mechanical stretch model of reactive-astrogliosis* Sci. Rep., **6**: 21896
Chuang, J-H., Tung, L-C., Yin, Y. and Lin, Y. (2013) *Differentiation of glutamatergic neurons from mouse embryonic stem cells requires raptor S6K signaling* Stem Cell Res., **11**, 1117-1128
Finelli, M.J., Sanchez-Pulido, L., Liu, K.X., Davies, K.E. and Oliver, P.L. (2016) *The evolutionarily conserved Tre2/Bub2/Cdc16 (TBC), lysin motif (LysM), domain catalytic (TLDc) domain is neuroprotective against oxidative stress* J. Biol. Chem., **291**, 2751–2763
Fujita, T., Chen, M.J., Li, B., Smith, N.A., Peng, W., Sun, W., Toner, M.J., Kress, B.T., Wang, L., Benraiss, A., Takano, T., Wang, S. and Nedergaard, M. (2014) *Neuronal transgene expression in dominant-negative SNARE mice* J. Neurosci., **34,**16594 –16604
Ingram, N.T., Khankan, R.R. and Phelps, P.E. (2016) *Olfactory ensheathing cells express a7 integrin to mediate their migration on laminin* PloS One, **11:** e0153394
Kruger, L.C., O'Malley, H.A., Hull, J.M., Kleeman, A., Patino, G.A. and Isom, L.L. (2016) *β1-C121W is down but not out: epilepsy-associated Scn1b-C121W results in a deleterious gain-of-function* J. Neurosci., **36**, 6213–6224

Mouse brain hippocampus (adult)

Ghosh, D., LeVault, K.R., Barnett, A.J. and Brewer, G.J. (2012) *A reversible early oxidized redox state that precedes macromolecular ROS damage in aging nontransgenic and 3xTg-AD mouse neurons* J. Neurosci., **32**, 5821–5832
Ghosh, D., LeVault, K.R. and Brewer, G.J. (2014) *Dual-energy precursor and nuclear erythroiderelated factor 2 activator treatment additively improve redox glutathione levels and neuron survival in aging and Alzheimer mouse neurons upstream of reactive oxygen species* Neurobiol. Aging, **35**, 179-190
Varghese, K., Das, M., Bhargava, N., Stancescu, M., Molnar, P., Kindy, M.S. and Hickman, J.J. (2009) *Regeneration and characterization of adult mouse hippocampal neurons in a defined in vitro system* J. Neurosci. Meth., **177**, 51–59

Mouse brain hippocampus (neo-natal)

Mou, L., Heldt, S.A. and Ressler, K.J. (2011) *Rapid brain-derived neurotrophic factor-dependent sequestration of amygdala and hippocampal $GABA_A$ receptors vis different tyrosine receptor kinase B-mediated phosphorylation pathways* Neuroscience, **176**, 72–85
O'Mahony, A., Raber, J., Montano, M., Foehr, E., Han, V., Lu, S-m., Kwon, H., LeFevour, A., Chakraborty-Sett, S. and Greene, W.C. (2006) *NF-κB/Rel regulates inhibitory and excitatory neuronal function and synaptic plasticity* Mol. Biol. Cell., **26**, 7283-7298
Wang, X.Q., Deriy, L.V., Foss, S., Huang, P., Lamb, F.S., Kaetzel, M.A., Bindokas, V., Marks, J.D. and Nelson, D.J. (2006) *CLC-3 channels modulate excitatory synaptic transmission in hippocampal neurons* Neuron, **52**, 321-333

Mouse brain hippocampus (post-natal)

Chen, M., Geoffroy, C.G., Wong, H.N., Tress, O., Nguyen, M.T., Holzman, L.B., Jin, Y. and Zheng, B. (2106) *Leucine Zipper-bearing Kinase promotes axon growth in mammalian central nervous system neurons* Sci. Rep., **6**: 31482
Jinadasa, T., Szabó, E.Z., Numata, M. and Orlowski, J. (2014) *Activation of AMP-activated protein kinase regulates hippocampal neuronal pH by recruiting Na^+/H^+ exchanger NHE5 to the cell surface* J. Biol. Chem., **289**, 20879–20897
Mahan, A.L., Mou, L., Shah, N., Hu, J-H., Worley, P.F. and Ressler, K.J. (2012) *Epigenetic modulation of Homer1a transcription regulation in amygdala and hippocampus with Pavlovian fear conditioning* J. Neurosci., **32**, 4651– 4659

Mouse brain mesencephalon (post-natal)

Tiwari, M., Herman, B. and Morgan, W.W. (2011) *A knockout of the caspase 2 gene produces increased resistance of the nigrostriatal dopaminergic pathway to MPTP-induced toxicity* Exp. Neurol., **229**, 421–428

Mouse brain olfactory bulb (post-natal)

Pathania, M., Torres-Reveron, J., Yan, L., Kimura, T., Lin, T.V., Gordon, V., Teng, Z-Q., Zhao, X., Fulga, T.A., Van Vactor, D. and Bordey, A. (2012) *miR-132 enhances dendritic morphogenesis, spine density, synaptic integration and survival of newborn olfactory bulb neurons* PLoS One, **7**: e38174

Mouse brain striatum (adult)

Ena, S.L., De Backer, J.F., Schiffmann, S.N. and de Kerchove d'Exaerde, A. (2013) *FACS array profiling identifies ecto-5' nucleotidase as a striatopallidal neuron-specific gene involved in striatal-dependent learning* J. Neurosci., **33**, 8794–8809

Lambot, L., Rodriguez, E.C., Houtteman, D., Li, Y., Schiffmann, S.N., Gall, D., and de Kerchove d'Exaerde, A. (2016) *Striatopallidal neuron NMDA receptors control synaptic connectivity, locomotor, and goal-directed behaviors* J. Neurosci., **36**, 4976–4992

Mouse brain trigeminal ganglia

Bertke, A.S., Swanson, S.M., Chen, J., Imai, Y., Kinchington, P.R. and Margolis, T.P. (2011) *A5-Positive primary sensory neurons are nonpermissive for productive infection with herpes simplex virus 1 in vitro* J. Virol., **85**, 6669–6677

Bertke, A.S., Apakupakul, K., Ma. AA., Imai, Y., Gussow. A.M., Wang, K., Cohen, J.I., Bloom, D.C., Margolis, T.P. (2012) *LAT region factors mediating differential neuronal tropism of HSV-1 and HSV-2 do not act in trans* PLoS One, **7**: e53281

Maroui, M.A., Callé, A., Cohen, C., Streichenberger, N., Texier, P., Takissian, J., Rousseau, A., Poccardi, N., Welsch, J. et al (2016) *Latency entry of herpes simplex virus 1 is determined by the interaction of its genome with the nuclear environment* PLoS Pathog., **12**: e1005834

Katzenell, S. and Leib, D.A. (2016) *Herpes simplex virus and interferon signaling induce novel autophagic clusters in sensory neurons* J. Virol., **90**, 4706-4719

Messer, H.G.P., Jacobs, D., Dhummakupt, A. and Bloom, D.C. (2015) *Inhibition of H3K27me3-specific histone demethylases JMJD3 and UTX blocks reactivation of herpes simplex virus 1 in trigeminal ganglion neurons* J. Virol., **89**, 3417-3420

Rosato, P.C. and Leib, D.A. (2014) *Intrinsic innate immunity fails to control herpes simplex virus and vesicular stomatitis virus replication in sensory neurons and fibroblasts* J. Virol., 88, 9991-10001

Mouse embryo

Barber, S.C., Higginbottom, A., Mead, R.J., Barber, S. and Shawa, P.J. (2009) *An in vitro screening cascade to identify neuroprotective antioxidants in ALS* Free Radical Biol. Med. **46** 1127–1138

Mouse spinal cord (adult)

Galvan, M.D., Luchetti, S., Burgos, A.M., Nguyen, H.X., Hooshmand, M.J., Hamers, F.P.T. and Anderson, A.J. (2008) *Deficiency in complement C1q improves histological and functional locomotor outcome after spinal cord injury* J. Neurosci., **28**, 13876 –13888

Foley, L.S., Fullerton, D.A., Bennett, D.T., Freeman, K.A., Mares, J., Bell, M.T., Cleveland, Jr, J.C., Weyant, M.J., Meng, X., Puskas, F. and Reece, T.B. (2015) *Spinal cord ischemia-reperfusion injury induces erythropoietin receptor expression* Ann. Thorac. Surg., **100**, 41–46

Foran, E., Bogrush, A., Goffredo, M., Roncaglia, P., Gustincich, S., Pasinelli, P., Trotti, D. (2011) *Motor neuron impairment mediated by a sumoylated fragment of the glial glutamate transporter EAAT2* Glia **59**, 1719–1731

Khayrullina, G., Bermudez, S. and Byrnes, K.R. (2015) *Inhibition of NOX2 reduces locomotor impairment, inflammation, and oxidative stress after spinal cord injury* J. Neuroinflammation, **12**: 172

Montoya-Gacharna, J.V., Sutachan, J.J., Chan, W.S., Sideris, A., Blanck, T.J.J. and Recio-Pinto, E. (2012) *Preparation of adult spinal cord motor neuron cultures under serum-free conditions* In Neurotrophic Factors: Methods and Protocols, Methods in Molecular Biology, vol. **846**, (Ed. Skaper, S.D.) Springer Science+Business Media, pp 103-116

Shen, S., Benoy, V., Bergman, J.A., Kalin, J.H., Frojuello, M., Vistoli, G., Haeck, W., Van Den Bosch, L. and Kozikowski, A.P. (2016) *Bicyclic-capped histone deacetylase 6 inhibitors with improved activity in a model of axonal Charcot−Marie−Tooth disease* ACS Chem. Neurosci., **7**, 240−258

Wang, P-Y., Koishi, K., McGeachie, A.B., Kimber, M., MacLaughlin, D.T., Donahoe, P.K. and McLennan, I.S. (2005) *Mullerian inhibiting substance acts as a motor neuron survival factor in vitro* Proc. Natl. Acad. Sci. USA, **102**, 16421-16425

Xie, Y., Zhou, B., Lin, M-Y., Wang, S., Foust, K.D. and Sheng, Z-H. (2015) *Endolysosomal deficits augment mitochondria pathology in spinal motor neurons of asymptomatic fALS mice* Neuron 87, 355–370

Mouse spinal cord (embryo)

Adherence

Vodouhe, C., Schmittbuhl, M., Boulmedais, F., Bagnard, D., Vautier, D., Schaaf, P., Egles, C., Voegel, J-C. and Ogier, J. (2004) *Effect of functionalization of multilayered polyelectrolyte films on motoneuron growth* Biomaterials, **26**, 545-554

Amyotrophic lateral sclerosis

Bernard-Marissal, N., Moumen, A., Sunyach, C., Pellegrino, C., Dudley, K., Henderson, C.E., Raoul, C. and Pettmann, B. (2012) *Reduced calreticulin levels link endoplasmic reticulum stress and Fas-triggered cell death in motoneurons vulnerable to ALS* J. Neurosci., **32**, 4901– 4912

Blizzard, C.A., Southam, K.A., Dawkins, E., Lewis, K.E., King, A.E., Clark, J.A. and Dickson, T.C. (2015) *Identifying the primary site of pathogenesis in amyotrophic lateral sclerosis − vulnerability of lower motor neurons to proximal excitotoxicity* Dis. Model. Mech., **8**, 215-224

Bowerman, M., Salsac, C., Coque, E., Eiselt, E., Deschaumes, R.G., Brodovitch, A., Burkly, L.C., Scamps, F. and Raoul, C. (2015) *Tweak regulates astrogliosis, microgliosis and skeletal muscle atrophy in a mouse model of amyotrophic lateral sclerosis* Hum. Mol. Genet., **24**, 3440–3456
Bowerman, M., Salsac, C., Coque, E., Eiselt, E., Deschaumes, R.G., Brodovitch, A., Burkly, L.C., Scamps, F. and Raoul, C. (2015) *Tweak regulates astrogliosis, microgliosis and skeletal muscle atrophy in a mouse model of amyotrophic lateral sclerosis* Hum. Mol. Genet., **24**, 3440–3456
Camu, W., Tremblier, B., Plassot, C., Alphandery, S., Salsac, C., Pageot, N., Juntas-Morales, R., Scamps, F., Daures, J-P. and Raoul, C. (2014) *Vitamin D confers protection to motoneurons and is a prognostic factor of amyotrophic lateral sclerosis* Neurobiol. Aging, **35**, 1198-1205

De Paola, M., Sestito, S.E., Mariani, A., Memo, C., Fanelli, R., Freschi, M., Bendotti, C., Calabrese, V. and Peri, F. (2016) *Synthetic and natural small molecule TLR4 antagonists inhibitmotoneuron death in cultures from ALS mouse model* Pharmacol. Res., **103**, 180–187

Ferraiuolo, L., Higginbottom, A., Heath, P.R., Barber, S., Greenald, D., Kirby, J. and Shaw, P.J. (2011) *Dysregulation of astrocyte–motoneuron cross-talk in mutant superoxide dismutase 1-related amyotrophic lateral sclerosis* Brain, **134**, 2627–2641

Gershoni-Emek, N., Mazza, A., Chein, M., Gradus-Pery, T., Xiang, X., Wan Li, K., Sharan, R. and Perlson, E. (2016) *Proteomic analysis of dynein-interacting proteins in amyotrophic lateral sclerosis synaptosomes reveals alterations in the RNA-binding protein Staufen1* Mol. Cell. Proteom., **15**, 506–522

Hogg, M.C., Mitchem, M.R., König, H-G. and Prehn, J.H.M. (2016) *Caspase 6 has a protective role in SOD1G93A transgenic mice* Biochim. Biophys. Acta, **1862**, 1063–1073

Lautenschläger, J., Prell, T., Ruhmer, J., Weidemann, L., Witte, O.W., Grosskreutz, J. (2013) *Overexpression of human mutated G93A SOD1 changes dynamics of the ER mitochondria calcium cycle specifically in mouse embryonic motor neurons* Exp. Neurol., **247**, 91–100

Lee, J.K., Shin, J.H., Hwang, S.G., Gwag, B.J., McKee, A.C., Lee, J, Kowall, N.W., Ryu, H., Lim, D-S. and Choi, E-J. (2013) *MST1 functions as a key modulator of neurodegeneration in a mouse model of ALS* Proc. Natl. Acad. Sci. USA, **110**, 12066–12071

Otsmane, B., Aebischer, J., Moumen, A. and Raoul, C., (2014) *Cerebrospinal fluid-targeted delivery of neutralizing anti-IFNγ antibody delays motor decline in an ALS mouse model* NeuroReport, **25**, 49–54

Prell, T., Lautenschlager, J., Witte, O.W., Carri, M.T. and Grosskreutz, J. (2012) *The unfolded protein response in models of human mutant G93A amyotrophic lateral sclerosis* Eur. J. Neurosci., **35**, 652-660

Prell, T., Lautenschläger, J., Weidemann, L., Ruhmer, J., Witte, O.W. and Grosskreutz, J. (2014) *Endoplasmic reticulum stress is accompanied by activation of NF-κB in amyotrophic lateral sclerosis* J. Neuroimmunol., **270**, 29–36

Sunyach, C., Michaud, M., Arnoux, T., Bernard-Marissal, N., Aebischer, J., Latyszenok, V., Gouarné, C. Raoul, C., Pruss, R.M., Bordet, T. and Pettmann, B. (2012) *Olesoxime delays muscle denervation, astrogliosis, microglial activation and motoneuron death in an ALS mouse model* Neuropharmacology, **62**, 2345-2352

Van Damme, P., Braeken, D., Callewaert, G., Robberecht, W. and Van Den Bosch, L. (2005) *GluR2 deficiency accelerates motor neuron degeneration in a mouse model of amyotropic lateral sclerosis* J. Neuropathol. Exp. Neurol., **64**, 605-612

Vargas, M.R., Johnson, D.A. and Johnson, J.A. (2011) *Decreased glutathione accelerates neurological deficit and mitochondrial pathology in familial ALS-linked hSOD1G93A mice model* Neurobiol. Dis., **43**, 543–551

Antioxidants

Bahia, P.K., Pugh, V., Hoyland, K., Hensley, V., Rattray, M. and Williams, R.J. (2012) *Neuroprotective effects of phenolic antioxidant tBHQ associate with inhibition of Fox03a nuclear translocation and activity* J. Neurochem., **123**, 182–191

Apoptosis (Fas)

Raoul, C., Barthelemy, C., Couzinet, A., Hancock, D., Pettmann, B. and Hueber, A-O. (2005) *Expression of a dominant negative form of Daxx in vivo rescues motoneurons from Fas (CD95)-induced cell death* J. Neurobiol., **62**, 178-188

Segura, M.F., Sole, C., Pascual, M., Moubarak, R.S., Perez-Garcia, M.J., Gozzelino, R., Iglesias, V., Badiola, N., Bayascas, J.R., Llecha, N., Rodriguez-Alvarez, J., Soriano, E., Yuste, V.J. and Comella, J.X. (2007) *The*

long form of Fas apoptotic inhibitory molecule is expressed specifically in neurons and protects them against death receptor-triggered apoptosis J. Neurosci., **27**, 11228-11241
Palandri, A., Salvador, V.R., Wojnacki, J., Vivinetto, A.L., Schnaar, R.L. and Lopez, P.H.H. (2015) *Myelin-associated glycoprotein modulates apoptosis of motoneurons during early postnatal development via NgR/p75NTR receptor-mediated activation of RhoA signaling pathways* Cell Death Dis., **6**: e1876
Ugolini, G., Raoul, C., Ferri, A., Haenggeli, C., Yamamoto, Y., Salaun, D., Henderson, C.E., Kato, A.C., Pettmann, B. and Hueber, A-O. (2003) *Fas/tumor necrosis factor receptor death signaling is required for axotomy-induced death of motoneurons in vivo* Neuroscience, **23**, 8526-8531

Astrocyte effects
Diana, V., Ottolina, A., Botti, F., Fumagalli, E., Calcagno, E., De Paola, M., Cagnotto, A., Invernici, G., Parati, E., Curti, D. and Mennini, T. (2010) *Neural precursor-derived astrocytes of wobbler mice induce apoptotic death of motor neurons through reduced glutamate uptake* Exp. Neurol., **225**, 163–172
Vargas, M.R., Johnson, D.A., Sirkis, D.W., Messing, A. and Johnson, J.A. (2008) *Nrf2 activation in astrocytes protects against neurodegeneration in mouse models of familial amyotrophic lateral sclerosis* J. Neurosci., **28**, 13574 –13581

Axonal degeneration
Benzina, O., Cloitre, T., Martin, M., Raoul, C., Gergely, C. and Scamps, F. (2014) *Morphology and intrinsic excitability of regenerating sensory and motor neurons grown on a line micropattern* PLoS One, **9**: e110687

Ca^{2+} regulation
Barneo-Muñoz, M., Juárez1, P., Civera-Tregón, A., Yndriago, L., Pla-Martin, D., Zenker, J., Cuevas-Martín, C., Estela, A. et al (2015) *Lack of GDAP1 induces neuronal calcium and mitochondrial defects in a knockout mouse model of Charcot-Marie-Tooth neuropathy* PLoS Genet., **11**: e1005115
Gou-Fabregas, M., Garcera, A., Mincheva, S., Perez-Garcia, M.J., Comella, J.X. and Soler, R.M. (2009) *Specific vulnerability of mouse spinal cord motoneurons to membrane depolarization* J. Neurochem., **110**, 1842-1854
Langou, K., Moumen, A., Pellegrino, C., Aebischer, J., Medina, I., Aebischer, P. and Raoul, C. (2010) *AAV-mediated expression of wild-type amd ALS-linked mutant VAPB selectively triggers death of motoneurons through a Ca^{2+}-dependent pathway* J. Neurochem., **114**, 795–809
Rainey-Smith, S.R., Andersson, D.A., Williams, R.J. and Rattray, M. (2010) *Tumour necrosis factor alpha induces rapid reduction in AMPA receptor-mediated calcium entry in motor neurons by increasing cell surface expression of the GluR2 subunit: relevance to neurodegeneration* J. Neurochem., **113**, 692–703
Rodriguez-Garcia, A., Rojo-Ruiz, J., Navas-Navarro, P., Aulestia, F.J., Gallego-Sandin, S., Garcia-Sancho, J. and Alonso, M.T. (2014) *GAP, an aequorin-based fluorescent indicator for imaging Ca^{2+} in organelles* Proc. Natl. Acad. Sci. USA, **111**, 2584–2589
Rousset, M., Cens, T., Menard, C., Bowerman, M., Bellis, M., Brusés, J., Raoul, C., Scamps, F. and Charnet, P. (2015) *Regulation of neuronal high-voltage activated Ca_V2 Ca^{2+} channels by the small GTPase RhoA* Neuropharmacology 97 (2015) 201e209

Cytokines
De Paola, M., Visconti, L., Vianello, E., Mattana, F., Banfi, G., Corsi, M.M., Beghi, E. and Mennini, T. (2011) *Circulating cytokines and growth factors in professional soccer players: correlation with in vitro-induced motor neuron death* Eur. J. Neurol., **18**, 85–92
Mir, M., Asesnio, V.J., Tolosa, L., Gou-Fabregas, M., Soler, R.M., Lladó, J. and Olmos, G (2009) *Tumor necrosis factor alpha and interferon gamma cooperatively induce oxidative stress and motoneuron death in rat spinal cord embryonic explants* Neuroscience **162**, 959–971

Degeneration/ER stress
Bernard-Marissal, N., Me´dard, J-J., Azzedine, H. and Chrast, R. (2015) *Dysfunction in endoplasmic reticulum mitochondria crosstalk underlies SIGMAR1 loss of function mediated motor neuron degeneration* Brian, **138**, 875–890
Montague, K., Malik, B., Gray, A.L., La Spada, A.R., Hanna, M.G., Szabadkai, G. and Greensmith, L. (2014) *Endoplasmic reticulum stress in spinal and bulbar muscular atrophy: a potential target for therapy* Brain, **137**, 1894–1906

Growth factors

De Paola, M., Visconti, L., Vianello, E., Mattana, F., Banfi, G., Corsi, M.M., Beghi, E. and Mennini, T. (2011) *Circulating cytokines and growth factors in professional soccer players: correlation with in vitro-induced motor neuron death* Eur. J. Neurol., **18**, 85–92

Payne, A.M., Zheng, Z., Messi, M.L., Milligan, C.E., Gonzalez, E. and Delbono, O. (2006) *Motor neurone targeting of IGF-1 prevents specific force decline in ageing mouse muscle* J. Physiol., **570**, 283-294

Inflammasomes

Ydens, E., Demon, D., Lornet, G., De Winter, V., Timmerman, V., Lamkanfi, M. and Janssens, S. (2015) *Nlrp6 promotes recovery after peripheral nerve injury independently of inflammasomes* J. Neuroinflam., **12**: 143

Methodology

De Paola, M., Diana, V., Bigini, P. and Mennini, T. (2008) *Morphological features and responses to AMPA receptor-mediated excitotoxicity of mouse motor neurons: comparison in purified, mixed anterior horn or motor neuron/glia cocultures* J. Neurosci. Meth., **170**, 85-95

Fallini, C., Bassell, G.J. and Rossoll, W. (2010) *High-efficiency transfection of cultured primary motor neurons to study protein localization, trafficking, and function* Mol. Neurodegener., **5**:17

Guettier-Sigrist, S., Appert-Collin, A., Duong, F., Azzouz, M., Coupin, G., Gies, J-P. and Poindron, P. (2005) *Improved methods for culturing rat and mouse motor neurons* Bio Valley Monogr. Basel Karger, **1**, 96-108

Hoque, R., Farooq, A., Ghani, A., Gorelick, F. and Mehal, W.Z. (2014) *Lactate reduces liver and pancreatic injury in Toll-like receptor-and inflammasome-mediated inflammation via GPR81-mediated suppression of innate immunity* Gastroenterology, **146**, 1763–1774

Neurotrophic factors

Appert-Collin, A., Hugel, B., Levy, R., Niederhoffer, N., Coupin, G., Lombard, Y., André, P., Poindron, P. and Gies, J.P. (2006) *Cyclin dependent kinase inhibitors prevent apoptosis of postmitotic mouse motoneurons* Life Sci., **79**, 484-490

Duong, F.H.T., Warter, J.M., Poindron, P. and Passilly, P. (1999) *Effect of the nonpeptide neurotrophic compound SR57746A on the phenotypic survival of purified mouse motoneurons* Br. J. Pharmacol., **128**, 1385-1392

Mincheva, S., Garcera, A., Gou-Fabregas, M., Encinas, M., Dolcet, X. and Soler, R.M. (2011) *The canonical nuclear factor-κB pathway regulates cell survival in a developmental model of spinal cord motoneurons* J. Neurosci., 31, 6493– 6503

Nitric oxide

Bishop, A., Gooch, R., Eguchi, A., Jeffrey, S., Smallwood, L., Anderson, J. and Estevez, A.G. (2009) *Mitigation of peroxynitrite-mediated nitric oxide (NO) toxicity as a mechanism of induced adaptive NO resistance in the CNS* J. Neurochem., **109**, 74-84

Bishop, A., Green Hobbs, K., Eguchi, A., Jeffrey, S., Smallwood, L., Pennie, C., Anderson, J. and Estevez, A.G. (2009) *Differential sensitivity of oligodendrocytes and motor neurons to reactive nitrogen species: implications for multiple sclerosis* J. Neurochem., **109**, 93-104

Lee, J., Ryu, H. and Kowall, N.W. (2009) *Differential regulation of neuronal and inducible nitric oxide synthase (NOS) in the spinal cord of mutant SOD1 (G93A) ALS mice* Biochem. Biophys. Res. Commun., **387**, 202–206

Programmed cell death

Aebischer, J., Sturny, R., Andrieu, D., Rieusset, A., Schaller, F., Geib, S., Raoul, C. and Muscatelli, F. (2011) *Necdin protects embryonic motoneurons from programmed cell death* PloS One **6**: e23764

Superoxide dismutase

Aebischer, j., Cassina, p., Otsmane, b., Moumen, A., Seilhean, D., Meininger, V., Barbeito, L., Pettmann, B. and Raoul, C. (2011) *IFNγ triggers a LIGHT-dependent selective death of motoneurons contributing to the non-cell-autonomous effects of mutant SOD1* Cell Death Differ. **18**, 754–768

Bernard-Marissal, N., Moumen, A., Sunyach, C., Pellegrino, C., Dudley, K., Henderson, C.E., Raoul, C. and Pettmann, B. (2012) *Reduced calreticulin levels link endoplasmic reticulum stress and Fas-triggered cell death in motoneurons vulnerable to ALS* J. Neurosci., **32**, 4901– 4912

Fischer, L.R., Igoudjil, A., Magrane, J., Li, Y., Hansen, J.M., Manfredi, G. and Glass, J.D. (2011) *SOD1 targeted to the mitochondrial intermembrane space prevents motor neuropathy in the Sod1 knockout mouse* Brain, **134**, 196–209

Lautenschläger, J., Prell, T., Ruhmer, J., Weidemann, L., Witte, O.W., Grosskreutz, J. (2013) *Overexpression of human mutated G93A SOD1 changes dynamics of the ER mitochondria calcium cycle specifically in mouse embryonic motor neurons* Exp. Neurol., **247**, 91–100

Lee, J., Ryu, H. and Kowall, N.W. (2009) *Motor neuronal protection by L-arginine prolongs survival of mutant SOD1(G93A) ALS mice* Biochem. Biophys. Res. Comm., **384**, 524–529

Lee, J.K., Shin, J.H., Hwang, S.G., Gwag, B.J., McKee, A.C., Lee, J, Kowall, N.W., Ryu, H., Lim, D-S. and Choi, E-J. (2013) *MST1 functions as a key modulator of neurodegeneration in a mouse model of ALS* Proc. Natl. Acad. Sci. USA, **110**, 12066–12071

Lunn, J.S., Sakowski, S.A., Kim, B., Rosenberg, A.A. and Feldman, E.L. (2009) *Vascular endothelial growth factor prevents G93A-SOD1-induced motor neuron degeneration* Develop. Neurobiol., **69**, 871-884

Prell, T., Lautenschlager, J., Witte, O.W., Carri, M.T. and Grosskreutz, J. (2012) *The unfolded protein response in models of humabn mutant G93A amyotrophic lateral sclerosis* Eur. J. Neurosci., **35**, 652-660

Raoul, C., Estévez, A.G., Nishimune, H., Cleveland, D.W., de Lapeyrière. O., Henderson, C.E., Haase, G. and Pettmann, B. (2002) *Motoneuron death triggered by a specific pathway downstream of Fas: Potentation by ALS-linked SOD1 mutations* Neuron, **35**, 1067-1083

Sunyach, C., Michaud, M., Arnoux, T., Bernard-Marissal, N., Aebischer, J., Latyszenok, V., Gouarné, C. Raoul, C., Pruss, R.M., Bordet, T. and Pettmann, B. (2012) *Olesoxime delays muscle denervation, astrogliosis, microglial activation and motoneuron death in an ALS mouse model* Neuropharmacology, **62**, 2345-2352

Vargas, M.R., Johnson, D.A. and Johnson, J.A. (2011) *Decreased glutathione accelerates neurological deficit and mitochondrial pathology in familial ALS-linked hSOD1G93A mice model* Neurobiol. Dis., **43**, 543–551

Spinal muscular atrophy

Chen, Y-C., Chang, J-G., Jong, Y-J., Liu, T-Y. and You, C-Y. (2015) *High expression level of Tra2-β1 is responsible for increased SMN2 exon 7 inclusion in the testis of SMA mice* PLoS One 10: e0120721

Survival

Garcera, A., Mincheva, S., Gou-Fabregas, M., Caraballo-Miralles, V., Lladó, J., Comella, J.X. and Soler, R.M. (2011) *A new model to study spinal muscular atrophy: Neurite degeneration and cell death is counteracted by BCL-XL overexpression in motoneurons* Neurobiol. Dis., **42**, 415–426

Wang, P-Y., Koishi, K. and McLennan, I.S. (2007) *BMP6 is axonally transported by motoneurons and supports their survival in vitro* Mol. Cell Neurosci., **34**, 653-661

Zhang, H., Xing, L., Rossoll, W., Wichterle, H., Singer, R.H. and Bassell, G.J. (2006) *Multiprotein complexes of the survival of motor neuron protein SMN with gemins traffic to neuronal processes and growth cones of motor neurons* J. Neurosci., **26**, 8622-8632

Synaptic differentiation

Misgeld, T., Kummer, T.T., Lichtman, J.W. and Sanes, J.R. (2005) *Agrin promotes synaptic differentiation by counteracting an inhibitory effect of neurotransmitter* Proc. Natl. Acad. Sci. USA, **102**, 11088-11093

Toll-like receptors

Goethals, S., Ydens, E., Timmerman, V. and Janssens, S. (2010) *Toll-like receptor expression in the peripheral nerve* Glia, **58**, 1701–1709

Virus receptor transport

Zussy, C. and Salinas, S. (2014) *Study of adenovirus and CAR axonal transport in primary neurons* In Methods Mol. Biol., **1089**, Adenovirus: Methods and Protocol (ed. Chillón, M. and Bosch, A.) Springer Science+Business Media, LLC pp 71-78

Mouse spinal cord (neo-natal)

Pavelko, K., Howe, C.L., Drescher, K.M., Gamez, J.D., Johnson, A.J., Wei, T., Ransohoff, R.M. and Roriguez, M. (2003) *Interleukin-6 protects anterior horn neurons from lethal virus-induced injury* J. Neurosci., **23**, 481-492

Mouse spinal cord (post-natal)

Benedusi, V., Martorana, F., Brambilla, L., Maggi, A. and la Rossi, D. (2012) *The peroxisome proliferator-activated receptor γ (PPARγ) controls natural protective mechanisms against lipid peroxidation in amyotrophic lateral sclerosis* J. Biol. Chem., **287**, 35899–35911

Freeman, K.A., Puskas, F., Bell, M.T., Mares, J.M., Foley, L.S., Weyant, M.J., Cleveland, J.C. et al (2015) *Alpha-2 agonist attenuates ischemic injury in spinal cord neurons* J. Surg. Res., **195**, 21-28

Kempf, A., Montani, L., Petrinovic, M.M., Schroeter, A., Weinmann, O., Patrignani, A. and Schwab, M.E. (2013) *Upregulation of axon guidance molecules in the adult central nervous system of Nogo-A knockout mice restricts neuronal growth and regeneration* Eur. J. Neurosci., **38**, 3567–3579

Lee, S., Ives, A.M. and Bertke, A.S. (2015) *Herpes simplex virus 1 reactivates from autonomic ciliary ganglia independently from sensory trigeminal ganglia to cause recurrent ocular disease* J. Virol., **89**, 8383-8391

Milligan, C. and Gifondorwa, D. (2011) *Isolation and culture of postnatal spinal motoneurons* In Methods Mol. Biol., **793**, Neurodegeneration: Methods and Protocols (ed. Manfredi, G. and Kawamata, H.) Springer Science+Business Media, LLC

Xu, J., Huang, G., Zhang, K., Sun, J., Xu, T., Li, R., Tao, H. and Xu, W. (2014) *Nrf2 activation in astrocytes contributes to spinal cord ischemic tolerance induced by hyperbaric oxygen preconditioning* J. Neuotrauma, **31**, 1343–1353

Rat brain amygdala

Jasnow, A.M., Ressler, K.J., Hammack, S.E., Chhatwal, J.P. and Rainnie, D.G. (2009) *Distinct subtypes of cholecystokinin (CCK)-containing interneurons of the basolateral amygdala identified using a CCK promoter-specific lentivirus* J. Neurophysiol., **101**, 1494–1506

Rat brain cerebellar

Martinez, J., Stessin, A.M., Campana, A., Hou, J., Nikulina, E., Buck, J., Levin, L.R. and Filbin, M.T. (2014) *Soluble adenylyl cyclase is necessary and sufficient to overcome the block of axonal growth by myelin-associated factors* J. Neurosci., **34**, 9281–9289

Rat brain cortex (adult)

Jones, T.T. and Brewer, G.J. (2009) *Critical age-related loss of cofactors of neuron cytochrome C oxidase reversed by estrogen* Exp. Neurol., **215**, 212–219

Jones, T.T. and Brewer, G.J. (2010) *Age-related deficiencies in complex I endogenous substrate availability and reserve capacity of complex IV in cortical neuron electron transport* Biochim. Biophys. Acta, **1797**, 167−176

Martin-Montañez , E., Pavia, J., Santin, L.J., Boraldi, F., Estivill-Torrus, G., Aguirre, J.A. and Garcia-Fernandez, M. (2014) *Involvement of IGF-II receptors in the antioxidant and neuroprotective effects of IGF-II on adult cortical neuronal cultures* Biochim. Biophys. Acta, **1842**, 1041–1051

McCormick, A.M., Maddipatla, M.V.S.N., Shi, S., Chamsaz, E.A, Yokoyama, H., Joy, A. and Leipzig, N.D. (2014) *Micropatterned coumarin polyester thin films direct neurite orientation* ACS Appl. Mater. Interfaces, **6**, 19655－19667

Patel, J.R. and Brewer, G. J. (2008) *Age-related differences in NFκB translocation and Bcl-2/Bax ratio caused by TNFα and Abeta42 promote survival in middle-age neurons and death in old neurons* Exp. Neurol., **213**, 93-100

Singh, A.K., Jiang, Y., Gupta, S., Younus, M. and Ramzan, M. (2013) *Anti-inflammatory potency of nano-formulated puerarin and curcumin in rats subjected to the lipopolysaccharide-induced inflammation* J. Med. Food, **16**, 899–911

Viel, J.J., McManus, D.Q., Brewer, G.J. (2004) *Postmortem effect of pentobarbital anesthetic on survival of adult cortical neurons in primary culture* Brain Res., **1009**, 219-222

Yip, P.K., Wong, L-F., Pattinson, D., Battaglia, A., Grist, J., Bradbury, E.J., Maden, M., McMahon, S.B. and Mazarakis, N.D. (2006) *Lentiviral vector expressing retinoic acid receptor β2 promotes of function after corticospinal tract injury in the adult rat spinal cord* Hum. Mol. Genet., **15**, 3107-3118

Yip, P.K., Wong, L-F., Sears, T.A., Yáñez-Muñoz, R.J. and McMahon, S.B. (2010) *Cortical overexpression of neuronal calcium sensor-1 induces functional plasticity in spinal cord following unilateral pyramidal tract injury in rat* PLoS Biol., **8**: e1000399

Rat brain cortex (embryo)

Cheng, Y.C., Chen, T-A., Chen, C-Y., Liang, C.M. and Liang, S-M. (2012) *3′Poly-G-tailed ODNs inhibit F-spondin to induce cell death and neurite retraction in rat embryonic neurons* Mol. Neurobiol., **45**, 536–549

Rat brain cortex (neo-natal)

de Vellis, J., Ghiani, C.A., Wanner, I.B. and Cole, R. (2010) *Preparation of normal and reactive astrocyte cultures* In, Protocols for Neural Cell Culture, Springer Protocols Handbooks, (ed. Doering, L.C.), Humana Press (Springer Science+Business Media), Totowa, NJ. pp 193-215

Rat brain cortex (post-natal)

Hannila, S.S., Siddiq, M.M., Carmel, J.B., Hou, J., Chaudhry, N., Bradley, P.M.J., Hilaire, M. Richman, E.L., Hart, R.P. and Filbin, M.T. (2013) *Secretory leukocyte protease inhibitor reverses inhibition by CNS myelin,*

promotes regeneration in the optic nerve, and suppresses expression of the transforming growth factor-β signaling protein Smad2 J. Neurosci., **33**, 5138 –5151
He, H., Deng, K., Siddiq, M.M., Pyie, A., Mellado, W., Hannila, S.S. and Filbin, M.T. (2016) *Cyclic AMP and polyamines overcome inhibition by myelin-associated glycoprotein through eIF5A-mediated increases in p35 expression and activation of Cdk5* J. Neurosci., **36,** 3079 –3091
Khankan, R.R., Wanner, I.B. and Phelps, P.E. (2015) *Olfactory ensheathing cell–neurite alignment enhances neurite outgrowth in scar-like cultures* Exp. Neurol., **269**, 93–101
Khankan. R.R., Griffis, K.G., Haggerty-Skeans, J.R., Zhong, H., Roy, R.R., Edgerton, V.R. and Phelps, P. (2016) *Olfactory ensheathing cell transplantation after a complete spinal sord transection mediates neuroprotective and immunomodulatory mechanisms to facilitate regeneration* J. Neurosci., **36**, 6269-6286
Siddiq, M.M., Hannila, S.S., Carmel, J.B., Bryson, J.B., Hou, J., Nikulina, E., Willis, M.R., Mellado, W. et al (2015) *Metallothionein-I/II promotes axonal regeneration in the central nervous system* J. Biol. Chem., **290**, 16343–16356

Rat brain stem

Evans, J., Sumners, C., Moore, J., Huentelmann, M.J., Deng, J., Gelband, C.H. and Shaw, G. (2002) *Characterization of mitotic neurons derived from adult rat hypothalamus and brain stem* J. Neurophysiol., **87**, 1076-1085
Hernandez-Morato, I., Pitman, M.J. and Sharma, S. (2016) *Muscle specific nucleus ambiguus neurons isolation and culturing* J. Neurosci. Meth., **273**, 33–39

Rat brain dentate gyrus

Howell, O.W., Doyle, K., Goodman, J,.H., Scharfman, H.E., Herzog, H., Pringle, A., Beck-Sickinger, A. G. and Gray, W.P. (2005) *Neuropeptide Y stimulates neuronal precursor proliferation in the post-natal and adult dentate gyrus* J. Neurochem., **93**, 560-570

Rat brain hippocampus (adult)

Cady, C., Evans, M.S. and Brewer, G.J. (2001) *Age-related differences in NMDA responses in cultured rat hippocampal neurons* Brain Res., **921**, 1-11
Edwards, D., Das, M., Molnar, P. and Hickman, J.J. (2010) *Addition of glutamate to serum-free culture promotes recovery of electrical activity in adult hippocampal neurons in vitro* J. Neurosci. Methods, **190**, 155–163
Gamerdinger, M., Hajieva1, P., Kaya1, A.M., Wolfrum, U., Hartl, F.U. and Behl, C. (2009) *Protein quality control during aging involves recruitment of the macroautophagy pathway by BAG3* EMBO J., **28**, 889–901
Hajieva, P., Kuhlmann, C., Luhmann, H.K. and Behl, C. (2009) *Impaired calcium homeostasis in aged hippocampal neurons* Neurosci. Lett., **451**, 119–123
Jones, T.T. and Brewer, G.J. (2009) *Critical age-related loss of cofactors of neuron cytochrome C oxidase reversed by estrogen* Exp. Neurol., **215**, 212–219
Jones, T.T. and Brewer, G.J. (2010) *Age-related deficiencies in complex I endogenous substrate availability and reserve capacity of complex IV in cortical neuron electron transport* Biochim. Biophys. Acta, **1797**, 167−176
Kour, S. and Rath, P.C. (2016) *All-trans retinoic acid induces expression of a novel intergenic long noncoding RNA in adult rat primary hippocampal neurons* J. Mol. Neurosci., **58**, 266-276
Majd, S., Rastegar, K., Zarifkar, A. and Takhshid, M.A. (2007) *Fibrillar beta-amyloid (Aβ) elevates extracellular Aβ in cultured hippocampal neurons of adult rats* Brain Res., **1185**, 321-327
Majd, S., Zarifkar, A., Rastegar, K. and Takhshid, M.A. (2008) *Culturing adult rat hippocampal neurons with long-interval changing media* Iran. Biomed. J., **12**, 101-107
Majd, S., Zarifkar, A., Rastegar, K. and Takhshid, M.A. (2008) *Different fibrillar Aβ 1-42 concentrations induce adult hippocampal neurons to reenter various phases of the cell cycle* Brain Res., **1218**, 224-229
Majd, S., Chegini, F., Chataway, T., Zhou, X-F. and Gai, W, (2013) *Reciprocal induction between α-synuclein and β-amyloid in adult rat neurons* Neurotox. Res., **23**, 69–78
Marks, J.D., Boriboun, C. and Wang, J. (2005) *Mitochondrial nitric oxide mediates decreased vulnerability of hippocampal neurons from immature animals to NMDA* J. Neurosci., **25**, 6561-6575
Ray, B., Bailey, J.A. Sarkar, S. and Lahiri, D.K. (2009) *Molecular and immunocytochemical characterization of primary neuronal cultures from adult rat brain: Differential expression of neuronal and glial protein markers* J. Neurosci. Methods, **184**, 294–302
Vasko, M.R., Guo, C. and Kelley, M.R. (2005) *The multifunctional DNA repair/redox enzyme Apel/Ref-1 promotes survival of neurons after oxidative stress* DNA Repair, **4**, 367-379
Vasko, M.R., Guo, C., Thompson, E.L. and Kelley, M.R. (2011) *The repair function of the multifunctional DNA repair/redox protein APE1 is neuroprotective after ionizing radiation* DNA Repair, **10**, 942– 952

Wang, S., Huang, G., Wang, Y., Huang, T., Lin, S. and Gu, J. (2013) *Up-regulation of immunoglobulin G gene expression in the hippocampus of rats subjected to acute immobilization stress* J. Neuroimmunol., **258**, 1–9

Rat brain hippocampus (embryo)

Cheng, Y.C., Chen, T-A., Chen, C-Y., Liang, C.M. and Liang, S-M. (2012) *3′Poly-G-tailed ODNs inhibit F-spondin to induce cell death and neurite retraction in rat embryonic neurons* Mol. Neurobiol., **45**, 536–549

Henriquez, B., Bustos, F.J., Aguilar, R., Becerra, A., Simon, F., Montecino, M. and van Zundert, B. (2013) *Ezh1 and Ezh2 differentially regulate PSD-95 gene transcription in developing hippocampal neurons* Mol. Cell. Neurosci., **57**, 130–143

Rat brain hippocampus (juvenile)

Gamerdinger, M., Hajieva1, P., Kaya1, A.M., Wolfrum, U., Hartl, F.U. and Behl, C. (2009) *Protein quality control during aging involves recruitment of the macroautophagy pathway by BAG3* EMBO J., **28**, 889–901

Rat brain hippocampus (neo-natal)

Choi, S.J., Kim, F., Schwartz, M.W. and Wisse, B.E. (2010) *Cultured hypothalamic neurons are resistant to inflammation and insulin resistance induced by saturated fatty acids* Am. J. Physiol. Endocrinol. Metab., **298**, E1122–E1130

Ehrenreich, H., Degner, D., Meller, J., Brines, M., Béhe, M., Hasselblatt, M., Woldt, H., Falkai, P., Knerlich, F., Jacob, S., von Ahsen, N., Maier, W., Brück, W., Rüther, E. Cerami, A., Becker, W. and Sirén, A-L. (2004) *Erythropoietin: a candidate compound for neuroprotection in schizophrenia* Mol. Psychiatry., **9**, 42-54

Fester, L., Zhou, L., Bütow, A., Huber, C., von Lossow, R., Prange-Kiel, J., Jarry, H. and Rune, G.M. (2009) *Cholesterol-promoted synaptogenesis requires the conversion of chelosterol to estradiol in the hippocampus* Hippocampus, **19**, 692-705

Fordyce, C.B., Jagasia, R., Zhu, X. and Schlichter, L.C. (2005) *Microglia Kv1.3 channels contribute to their ability to kill neurons* J. Neurosci., **25**, 7139-7149

Howell, O.W., Scharfman, H.E., Herzog, H., Sundstrom, L.E., Beck-Sickinger, A and Gray, W.P. (2003) *Neuropeptide Y is neuroproliferative for hippocampal precursor cells* J. Neurochem., **86**, 646-659

Howell, O.W., Doyle, K., Goodman, J,.H., Scharfman, H.E., Herzog, H., Pringle, A., Beck-Sickinger, A. G. and Gray, W.P. (2005) *Neuropeptide Y stimulates neuronal precursor proliferation in the post-natal and adult dentate gyrus* J. Neurochem., **93**, 560-570

Kretz, O., Fester, L., Wehrenberg, U., Zhou, L., Brauckmann, S., Zhao, S., Prange-Kiel, J., Naumann, T., Jarry, H., Frotscher, M. and Rune, G. M. (2004) *Hippocampal synapses depend on hippocampal estrogen synthesis* J. Neurosci., **24**, 5913-5921

Liu, Y., Ford, B., Mann, M.A. and Fischbach, G.D. (2001) *Neuregulins increase α7 nicotinic acetylcholine receptors and enhance excitatory synaptic transmission in GABAergic interneurons of the hippocampus* J. Neurosci., **21**, 5660-5669

Li, Q., Lau, A., Morris, T.J., Guo, L., Fordyce, C.B. and Stanley, E.F. (2004) *A syntaxin 1, $G\alpha_o$, and N-type calcium channel complex at a presynaptic nerve terminal: analysis by quantitative immunocolocalization* J. Neurosci., **24**, 4070-4081

Marks, J.D., Bindokas, V.P. and Zhang, X-M. (2001) *Maturation of vulnerability to excitotoxicity: intracellular mechanisms in cultured postnatal hippocampal neurons* Dev. Brain Res., **124**, 101-116

Marks, J.D., Boriboun, C. and Wang, J. (2005) *Mitochondrial nitric oxide mediates decreased vulnerability of hippocampal neurons from immature animals to NMDA* J. Neurosci., **25**, 6561-6575

Nuñez-Villena, F., Becerra, A., Echeverría, C., Briceño, N., Porras, O., Armisén, R., Varela, D., Montorfano, I, Sarmiento, D. and Simon, F. (2011) *Increased expression of the transient receptor potential melastatin 7 channel is critically involved in lipopolysaccharide-induced reactive oxygen species-mediated neuronal death* Antioxid. Redox Signal., **15**, 2425–2438

Qin, J., Berdyshev. E., Goya, J., Natarajan, V. and Dawson, G. (2010) *Neurons and oligodendrocytes recycle sphingosine 1-phosphate to ceramide: significance for apoptosis and multiple sclerosis* J. Biol. Chem., **285**, 14134-14143

Von Schassen, C., Fester, L., Prange-Kiel, J., Lohse, C., Huber, C., Böttner, M. and Rune, G.M. (2006) *Oestrogen synthesis in the hippocampus: role in axon outgrowth* J. Neuroendocrinol., **18**, 847-856

Wang, X.Q., Deriy, L.V., Foss, S., Hunag, P., Lamb, F.S., Kaetzel, M.A., Bindokas, V., Marks, J.D. and Nelson, D.J. (2006) *CLC-3 channels modulate excitatory synaptic transmission in hippocampal neurons* Neuron, **52**, 321-333

Wong, W. and Schlichter, L.C. (2004) *Differential recruitment of Kv1.4 and Kv4.2 to lipid rafts by PSD-95* J. Biol. Chem., **279**, 444-452

Zhou, L., Lehan, N., Wehrenberg, U., Disteldorf, E., von Lossow, R., Mares, U., Jarry, H. and Rune, G.M. (2007) *Neuroprotection by estradiol: A role of aromatase against spine synapse loss after blockade of $GABA_A$ receptors* Exp. Neurol., **203**, 72-81

Rat brain hippocampus (post-natal)

Hannila, S.S., Siddiq, M.M., Carmel, J.B., Hou, J., Chaudhry, N., Bradley, P.M.J., Hilaire, M. Richman, E.L., Hart, R.P. and Filbin, M.T. (2013) *Secretory leukocyte protease inhibitor reverses inhibition by CNS myelin, promotes regeneration in the optic nerve, and suppresses expression of the transforming growth factor-β signaling protein* Smad2 J. Neurosci., **33**, 5138 –5151

Siddiq, M.M., Hannila, S.S., Carmel, J.B., Bryson, J.B., Hou, J., Nikulina, E., Willis, M.R., Mellado, W. et al (2015) *Metallothionein-I/II promotes axonal regeneration in the central nervous system* J. Biol. Chem., **290**, 16343–16356

Rat brain hypothalamus

Choi, S.J., Kim, F., Schwartz, M.W. and Wisse, B.E. (2010) *Cultured hypothalamic neurons are resistant to inflammation and insulin resistance induced by saturated fatty acids* Am. J. Physiol. Endocrinol. Metab., **298**, E1122–E1130

Evans, J., Sumners, C., Moore, J., Huentelmann, M.J., Deng, J., Gelband, C.H. and Shaw, G. (2002) *Characterization of mitotic neurons derived from adult rat hypothalamus and brain stem* J. Neurophysiol., **87**, 1076-1085

Malikov, V. and Madeira, M.D. (2013) *Regulation of ERα protein expression by 17β-estradiol in cultured neurons of hypothalamic ventromedial nucleus* Neurochem. Res., **38**, 82–89

Rat brain mesencephalic area

Majd, S., Smardencas, A., Parish, C.L. and Drago, J. (2011) *Development of an in vitro model to evaluate the regenerative capacity of adult brain-derived tyrosine hydroxylase-expressing dopaminergic neurons* Neurochem. Res., **36**, 967–977

Rat brain striatal

Rivera-Ramírez, N., Montejo-Lopez, W., Lopez-Mendez, M.C., Guerrero-Hernandez, A., Molina-Hernandez, A., García-Hernandez, U. and Arias-Montano, J.A. (2016) *Histamine H3 receptor activation stimulates calcium mobilization in a subpopulation of rat striatal neurons in primary culture, but not in synaptosomes* Neurochem. Int., **101**, 38-47

Rat brain, ventral brain stem

Halum, S.L., McRae, B., Bijangi-Vishehsaraei, K. and Hiatt, K. (2012) *Neurotrophic factor-secreting autologous muscle stem cell therapy for the treatment of laryngeal denervation injury* Laryngoscope, **122**, 2482–2496

Rat spinal cord (adult)

Brinn, M., Zhao, S., Kumaratilake, J., Lu, T-F., Freeman, B., Al-Sarawi, S. and Henneberg, M. (2015) *Axon stretch growth of adult primary motor neurons* J. Neurochem, **134** (Suppl. 1), 333

Doan, L.V., Eydlin, O., Piskoun, B., Kline, R.P., Recio-Pinto, E., Rosenberg, A.D., Blanck, T.J.J. and Xu, F. (2014) *Despite differences in cytosolic calcium regulation, lidocaine toxicity is similar in adult and neonatal rat dorsal root ganglia in vitro* Anesthesiology, **120**, 50-61

He, S-Q., Yang, F., Perez, F.M., Xu, Q., Shechter, R., Cheong, Y-K., Carteret, A.F., Dong, X., Sweitzer, S.M., Raja, S.N. and Guan, Y. (2013) *Tolerance develops to the antiallodynic effects of the peripherally acting opioid loperamide hydrochloride in nerve-injured rats* Pain, **154**, 2477–2486

Huang, S., Liu, X., Zhang, J., Bao, G., Xu, G., Sun, Y., Shen, Q., Lian, M., Huang, Y. and Cui, Z. (2015) *Expression of peroxiredoxin 1 after traumatic spinal cord injury in rats* Cell. Mol. Neurobiol., **35**, 1217–1226

Nguyen, H.X., Beck, K.D. and Anderson, A.J. (2011) *Quantitative assessment of immune cells in the injured spinal cord tissue by flow cytometry: a novel use for a cell purification method* J. Visualized Exp., **50**: 1-5

Rat spinal cord (embryo)

Amyotrophic lateral sclerosis

Andries, M., Van Damme, P., Robberecht, W. and van den Bosch, L. (2007) *Ivermectin inhibits AMPA receptor-mediated excitotoxicity in cultured motor neurons and extends the life span of a transgenic mouse model of amytrophic lateral sclerosis* Neurobiol. Dis., **25**, 8-16

Song, W., Song, Y., Kincaid, B., Bossy, B. and Bossy-Wetzel, E. (2013) *Mutant SOD1G93A triggers mitochondrial fragmentation in spinal cord motor neurons: Neuroprotection by SIRT3 and PGC-1α* Neurobiol. Dis., **51**, 72–81
Wang, W., Li, L., Lin, W-L., Dickson, D.W., Petrucelli, L., Zhang, T. and Wang, X. (2013) *The ALS disease-associated mutant TDP-43 impairs mitochondrial dynamics and function in motor neurons* Hum. Mol. Genet., **22**, 4706–4719

Apoptosis

Carlton, E., Teng, Q., Federici, T., Yang, J., Riley, J. and Boulis, N.M. (2008) *Fusion of the tetanus toxin C fragment binding domain and Bcl-xL for protection of peripheral nerve neurons* Neurosurgery, **63**, 1175-1184
Gandelman, M., Levy, M., Cassina, P., Barbeito. L. and Beckman, J.S. (2013) *P2X7 receptor-induced death of motor neurons by a peroxynitrite/FAS-dependent pathway* J. Neurochem., **126**, 382-388

Arginase 1

Estévez, A.G., Sahawneh, M.A., Lange, P.S., Bae, N., Egea, M. and Ratan, R.R. (2006) *Arginase 1 regulation of nitric oxide production is key to survival of trophic factor-deprived motor neurons* J. Neurosci., **26**, 8512-8516
Ma, T.C., Campana, A., Lange, P.S., Lee, H-H., Banerjee, K., Bryson, J.B., Mahishi L., Alam, S., Giger, R.J., Barnes, S., Morris, S.M., Willis, D.E., Twiss, J.L., Filbin, M.T. and Ratan, R.R. (2010) *A large-scale chemical screen for regulators of the arginase 1 promoter identifies the soy isoflavone daidzein as a clinically approved small molecule that can promote neuronal protection or regeneration via a cAMP-independent pathway* J. Neurosci., **30**, 739-748

Astrocyte interactions

Domeniconi, M., Hempstead, B.L. and Chao, M.V. (2007) *Pro-NGF secreted by astrocytes promotes motor neuron cell death* Mol. Cell. Neurosci., **34**, 271-279
Miquel, E., Cassina, A., Martínez-Palma, L., Bolatto, C., Trías, E., Gandelman, M., Radi, R., Barbeito, L. and Cassina, P. (2012) *Modulation of astrocytic mitochondrial function by dichloroacetate improves survival and motor performance in inherited amyotrophic lateral sclerosis* PLoS One, **7**: e34776
Ragancokova, D., Jahn, K., Kotsiari, A., Schlesinger, F., Haastert, K., Stangel, M., Petri, S. and Krampfl, K. (2009) *Analysis of neuroprotective effects of valproic acid on primary motor neurons in monoculture or co-cultures with astrocytes or Schwann cells* Cell. Mol. Neurobiol., **29**, 1037–1043
Wanner, I.B., Deik, A., Torres, M., Rosendahl, A., Neary, J.T., Lemmon, V.P. and Bixby, J.L. (2008) *A new in vitro model of the glial scar inhibits axon growth* Glia, **56**, 1691-1709

Axon regeneration

Liu, Y., Grumbles, R.M. and Thomas, C.K. (2013) *Electrical stimulation of embryonic neurons for 1 hour improves axon regeneration and the number of reinnervated muscles that function* J. Neuropathol. Exp. Neurol., **72**, 697-707

Ca^{2+} regulation

Castillo, C., Norcini, M., Baquero-Buitrago, J., Levacic, D., Medina, R., Montoya-Gacharna, J.V., Blanck, T.J.J., Dubois, M. and Recio-Pintoa, E. (2011) *The N-methyl-D-aspartate-evoked cytoplasmic calcium increase in adult rat dorsal root ganglion neuronal somata was potentiated by substance P pertreatment in a protein kinase C-dependent manner* Neuroscience, **177**, 308–320
Grosskreutz, J., Haastert, K., Dewil, M., Van Damme, P., Callewaert, G., Robberecht, W., Dengler, R. and Van den Bosch, L. (2007) *Role of mitochondria in kainate-induced fast Ca^{2+} transients in cultured spinal motor neurons* Cell Calcium, **42**, 59-69
Haastert, K., Grosskreutz, J., Jaeckel, M., Laderer, C., Bufler, J., Grothe, C. and Claus, P. (2005) *Rat embryonic motoneurons in long-term co-culture with Schwann cells – a system to investigate motoneuron diseases on a cellular level in vitro* J. Neurosci. Meth., **142**, 275-284
Jahn, K., Grosskreutz, J., Haastert, K., Ziegler, E., Schlesinger, F., Grothe, C., Dengler, R. and Bufler, J. (2006) *Temporospatial coupling of networked synaptic activation of AMPA-type glutamate receptor channels and calcium transients in cultured motoneurons* Neuroscience, **142**, 1019-1029

Culture of

Guettier-Sigrist, S., Appert-Collin, A., Duong, F., Azzouz, M., Coupin, G., Gies, J-P. and Poindron, P. (2005) *Improved methods for culturing rat and mouse motor neurons* Bio Valley Monogr. Basel Karger, **1**, 96-108
Sepehr, A., Ruud, J. and Mohseni, S. (2009) *Neuron survival in vitro is more influenced by the developmental age of the cells than by glucose condition* Cytotechnology, **61**, 73–79

Vincent, A.M. and Feldman, E.L. (2010) *Primary sensory and motor neuron cultures* In, Protocols for Neural Cell Culture, Springer Protocols Handbooks, (ed. Doering, L.C.), Humana Press (Springer Science+Business Media), Totowa, NJ. pp 161-173

Culture, nanofibres

Corey, J.M., Gertz, C.C., Wang, B-S., Birrell, L.K., Johnson, S.L., Martin, D.C. and Feldman, E.L. (2008) *The design of electrospun PLLA nanofiber scaffolds compatible with serum-free growth of primary motor neuron and sensory neurons* Acta Biomat., **4**, 863-875
Gertz, C.C., Leach, M.K., Birrell, L.K., Martin, D.C., Feldman, E.L. and Corey, J.M. (2010) *Accelerated neuritogenesis and maturation of primary spinal motor neurons in response to nanofibers* Dev. Neurobiol., **70**, 589–603
Leach, M.K., Feng, Z-Q., Gertz, C.C., Tuck, S.J., Regan, T.M., Naim, Y., Vincent, A.M. and Corey, J.M. (2011) *The culture of primary motor and sensory neurons in defined media on electrospun poly-L-lactide nanofiber scaffolds* J. Visualized Exp., **48**: 1-5
Martin, D.C., Wu, J., Shaw, C.M., King, Z., Spanninga, S.A., Richardson-Burns, S., Hendricks, J. and Yang, J. (2010) *The morphology of Poly(3,4-Ethylenedioxythiophene)* Polymer Rev., **50**, 340–384

Gene expression

Rossi, S.L., Lumpkin, C.J., Harris, A.W., Holbrook, J., Gentillon, C., McCahan, S.M., Wang, W. and Butchbach, M.E.R. (2016) *Identification of early gene expression changes in primary cultured neurons treated with topoisomerase I poisons* Biochem. Biophys. Res. Comm., **479**, 319-324

Growth factors

De Muynck, L., Herdewyna, S., Beel, S., Scheveneels, W., Van Den Bosch, L., Robberecht , W. and Van Damme, P. (2013) *The neurotrophic properties of progranulin depend on the granulin E domain but do not require sortilin binding* Neurobiol. Aging, **34**, 2541-2547
Poesen, K., Lambrechts, D., Van Damme, P., Dhondt, J., Bender, F., Frank, N., Bogaert, E., Claes, B., Heylen, L., Verheyen, A., Raes, K., Tjwa, M., Eriksson, U., Shibuya, M., Nuydens, R., Van Den Bosch, L., Meert, T., D'Hooge, R., Sendtner, M., Robberecht, W., and Carmeliet P. (2008) *Novel role for vascular endothelial growth factor (VEGF) receptor-1 and its ligand VEGF-B in motor neuron degeneration* J. Neurosci., **15**, 10451-10459
Wang, J., Van Damme, P., Cruchaga, C., Gitcho, M.A., Vidal, J.M., Seijo-Martinez, M., Wang, L., Wu, J.Y., Robberecht, W. and Goate, A. (2010) *Pathogenic cysteine mutations affect progranulin function and production of mature granulins* J. Neurochem. (2010) 112, 1305–1315

Inflammation

Beck, K.D., Nguyen, H.X., Galvan, M.D., Salazar, D.L., Woodruff, T.M. and Anderson, A.J. (2010) *Quantitative analysis of cellular inflammation after traumatic spinal cord injury: evidence for a multiphasic inflammatory response in the acute to chronic environment* Brain **133**, 433–447

Methodology

Graber, D.J. and Harris, B.T. (2013) *Purification and culture of spinal motor neurons* Cold Spring Harb. Protoc., prot074161, pp 319-326
Southam, K.A., King, A.E., Blizzard, C.A., McCormack, G.H. and Dickson, T.C. (2015) *A novel in vitro primary culture model of the lower motor neuron–neuromuscular junction circuit* In Neuromethods, **103**, Microfluidic and Compartmentalized Platforms for Neurobiological Research (ed. Biffi, E.) Springer Science+Business Media New York, pp 181-193

Muscular atrophy/reinnervation

Gassman, A., Hao, L.T., Bhoite, L., Bradford, C.L., Chien, C-B., Beattie, C.E. and Manfredi, J.P. (2013) *Small molecule suppressors of Drosophila kinesin deficiency rescue motor axon development in a zebrafish model of spinal muscular atrophy* PLoS One, **8**: e74325
Liu, Y., Grumbles, R.M. and Thomas, C.K. (2014) *Electrical stimulation of transplanted motoneurons improves motor unit formation* J. Neurophysiol., **112**, 660–670

Na^+-K^+-$2Cl^-$ co-transporter

Chabwine, J.N., Talavera, K., Verbert, L., Eggermont, J., Vanderwinden, J-M., De Smedt, H., Van Den Bosch, L., Robberecht, W., Callewaert, G. (2009) *Differential contribution of the Na^+-K^+-$2Cl^-$ cotransporter NKCC1 to chloride handling in rat embryonic dorsal root ganglion neurons and motor neurons* FASEB J., **23**, 1168–1176

Nerve repair/growth

Feng, Z-Q., Franz, E.W., Leach, M.K., Winterroth, F., White, C.M., Rastogi, A., Gu, Z-Z. and Corey, J.M. (2016) *Mechanical tension applied to substrate films specifies location of neuritogenesis and promotes major neurite growth at the expense of minor neurite development* J. Biomed Mater. Res. Part A, **104A**, 966–974

Irobi, J., Almeida-Souza, L., Asselbergh, B., De Winter, V., Goethals, S., Dierick, I., Krishnan, J., Timmermans, J-P., Robberecht, W., De Jonghe, P., Van Den Bosch, L., Janssens, S. and Timmerman, V. (2010) *Mutant HSPB8 causes motor neuron-specific neurite degeneration* Hum. Mol. Genet., **19**, 3254–3265

Montoya-Gachana, J.V., Sutachan, J.J., Chan, W.S., Sideris, A., Blanck, T.J.J. and Recio-Pinto, E. (2009) *Muscle-conditioned media and cAMP promote survival and neurite outgrowth of adult spinal cord motor neurons* Exp. Neurol., **220** 303−315

Neuromuscular junction/signalling

Das, M., Rumsey, J.W., Bhargava, N., Stancescu, M. and Hickman, J.J. (2010) *A defined long-term in vitro tissue engineered model of neuromuscular junctions* Biomaterials **31**, 4880-4888

Southam, K.A., King, A.E., Blizzard, C.A., McCormack, G.H. and Dickson, T.C. (2015) *A novel in vitro primary culture model of the lower motor neuron–neuromuscular junction circuit* In Neuromethods, **103**, Microfluidic and Compartmentalized Platforms for Neurobiological Research (ed. Biffi, E.) Springer Science+Business Media New York, pp 181-193

Neurotrophic factors

Deinhardt, K., Reversi, A., Berninghausen, O., Hopkins, C.R., and Schiavo, G. (2007) *Neurotrophins redirect* $p75^{NTR}$ *from a clathrin-independent to a clathrin-dependent pathway coupled to axonal transport* Traffic, **8**, 1736-1749

Niu, C. and Yip, H.K. (2011) *Neuroprotective signaling mechanisms of telomerase are regulated by brain-derived neurotrophic factor in rat spinal cord motor neurons* J. Neuropathol. Exp. Neurol., **70**, 634-652

Van Damme, P., Van Hoecke, A., Lambrechts, D., Vanacker, P., Bogaert, E., van Swieten, J., Carmeleit, P., Van Den Bosch, L. and Robberecht, W. (2008) *Progranulin functions as a neurotrophic factor to regulate neurite outgrowth and enhance neuronal survival* J. Cell Biol., **181**, 37-41

NFE2-related factor 2

Sporn, M., Beal, M.F. and Kiaei, M. (2011) *Neuroprotective effect of Nrf2/ARE activators, CDDO ethylamide and CDDO trifluoroethylamide, in a mouse model of amyotrophic lateral sclerosis* Free Radic. Biol. Med., **51**, 88–96

Nitric oxide

Estévez, A.G., Sahawneh, M.A., Lange, P.S., Bae, N., Egea, M. and Ratan, R.R. (2006) *Arginase 1 regulation of nitric oxide production is key to survival of trophic factor-deprived motor neurons* J. Neurosci., **26**, 8512-8516

Non-NMDA receptors

King, A.E., Dickson, T.C., Blizzard, C.A., Foster, S.S., Chung, R.S., West, A.K., Chuah, M.I. and Vickers, J.C. (2007) *Excitotoxicity mediated by non-NMDA receptors causes axonopathy in long-term cultured spinal motor neurons* Eur. J. Neurosci., **26**, 215102159

Schwann cell interactions

Haastert, K., Grosskreutz, J., Jaeckel, M., Laderer, C., Bufler, J., Grothe, C. and Claus, P. (2005) *Rat embryonic motoneurons in long-term co-culture with Schwann cells – a system to investigate motoneuron diseases on a cellular level in vitro* J. Neurosci. Meth., **142**, 275-284

Ragancokova, D., Jahn, K., Kotsiari, A., Schlesinger, F., Haastert, K., Stangel, M., Petri, S. and Krampfl, K. (2009) *Analysis of neuroprotective effects of valproic acid on primary motor neurons in monoculture or co-cultures with astrocytes or Schwann cells* Cell. Mol. Neurobiol., **29**, 1037–1043

Rumsey, J.W., Das, M., Stancescu. M., Bott, M., Fernandez-Valle, C. and Hickman, J.J. (2009) *Node of Ranvier formation on motoneurons in vitro* Biomaterials **30**, 3567–3572

SOD-1

Lobsiger, C.S., Boillée, S. and Cleveland, D.W. (2007) *Toxicity from different SOD1 mutants dysregulates the complement system and the neuronal regenerative response in ALS motor neurons* Proc. Natl. Acad. Sci. USA, **104**, 7319-7326

Magrané, J., Sahawneh, M.A., Przedborski, S., Estévez, A.G. and Manfredi, G. (2012) *Mitochondrial dynamics and bioenergetic dysfunction is associated with synaptic alterations in mutant SOD1 motor neurons* J. Neurosci., **32**, 229 –242
Marchetto, M.C.N., Muotri, A.R., Mu, Y., Smith, A.M., Cezar, G.G. and Gage, F.H. (2008) *Non-cell-autonomous effect of human SOD1G37R astrocytes on motor neurons derived from human embryonic stem cells* Cell Stem Cell. **3**, 649-657
Sahawneh, M.A., Ricart, K.C., Roberts, B.R., Bomben, V.C., Basso, M., Ye, Y., Sahawneh, J., Franco, M.C., Beckman, J.S. and Estévez, A.G. (2010) *Cu,Zn-superoxide dismutase increases toxicity of mutant and zinc-deficient superoxide dismutase by enhancing protein stability* J. Biol. Chem., **285**, 33885-33897
Song, W., Song, Y., Kincaid, B., Bossy, B. and Bossy-Wetzel, E. (2013) *Mutant SOD1G93A triggers mitochondrial fragmentation in spinal cord motor neurons: Neuroprotection by SIRT3 and PGC-1α* Neurobiol. Dis., **51**, 72–81
Trumbull, K.A., McAllister, D., Gandelman, M.M., Fung, W.Y., Lew, T., Brennan, L., Lopez, N., Morré, J., Kalyanaraman, B., Beckman, J.S. (2012) *Diapocynin and apocynin administration fails to significantly extend survival in G93A SOD1 ALS mice* Neurobiol. Dis., **45**, 137–144

Spinal motor control
Guo, X., Ayala, J.E., Gonzalez, M., Stancescu, M., Lambert, S. and Hickman, J.J. (2012) *Tissue engineering the monosynaptic circuit of the stretch reflex arc with co-culture of embryonic motoneurons and proprioceptive sensory neurons* Biomaterials, **33**, 5723-5731

Topoisomerase poisons
Rossi, S.L., Lumpkin, C.J., Harris, A.W., Holbrook, J., Gentillon, C., McCahan, S.M., Wang, W. and Butchbach, M.E.R. (2016) *Identification of early gene expression changes in primary cultured neurons treated with topoisomerase I poisons* Biochem. Biophys. Res. Comm., **479**, 319-324

Ubiquitin ligase
Lassot, I., Robbins, I., Kristiansen, M., Rahmeh, R., Jaudon, F., Magiera, M.M., Mora, S., Vanhille, L., Lipkin, A., Pettmann, B., Ham, J. and Desagher, S. (2010) *Trim17, a novel E3 ubiquitin-ligase, initiates neuronal apoptosis* Cell Death Differ. **17**, 1928–1941

Valproic acid
Ragancokova, D., Song, Y., Nau, H., Dengler, R., Krampfl, K. and Petri, S. (2010) *Modulation of synaptic transmission and analysis of neuroprotective effects of valproic acid and derivates in rat embryonic motoneurons* Cell. Mol. Neurobiol., **30**, 891–900

Viral transduction
Eleftheriadou, I., Trabalza, A., Ellison, S.M., Gharun, I.K. and Mazarakis, N.D. (2014) *Specific retrograde transduction of spinal motor neurons using lentiviral vectors targeted to presynaptic NMJ receptors* Mol. Ther., **22**, 1285–1298
Hislop, J.N., Islam, T.A., Eleftheriadou, I., Carpentier, D.C.J., Trabalza, A., Parkinson, M., Schiavo, G. and Mazarakis, N.D. (2014) *Rabies virus envelope glycoprotein targets lentiviral vectors to the axonal retrograde pathway in motor neurons* J. Biol. Chem., **289**, 16148-16163
Peluffo, H., Foster, E., Ahmed, S.G., Lago, N., Hutson, T.H., Moon, L., Yip, P., Wanisch, K., Caraballo-Miralles, V., Olmos, G., Llado, J., McMahon, S.B. and Yáñez-Muñoz, R.J. (2013) *Efficient gene expression from integration-deficient lentiviral vectors in the spinal cord* Gene Ther., **20**, 645–657
Trabalza, A., Georgiadis, C., Eleftheriadou, I., Hislop, J.N., Ellison, S.M., Karavassilis, M.E. and Mazarakis, N.D. (2013) *Venezuelan equine encephalitis virus glycoprotein pseudotyping confers neurotropism to lentiviral vectors* Gene Ther., **20**, 723–732

Rat spinal cord (post-natal)
Southam, K.A., King, A.E., Blizzard, C.A., McCormack, G.H. and Dickson, T.C. (2013) *Microfluidic primary culture model of the lower motor neuron–neuromuscular junction circuit* J. Neurosci. Methods, **218**, 164– 169

3 Turtle cerebral hemisphere
Milton, S.L., Nayak, G., Kesaraju, S., Kara, L. and Prentice, H.M. (2007) *Suppression of reactive oxygen species production enhances neuronal survival in vitro and in vivo in the anoxia-tolerant turtle Trachemys scripta* J. Neurochem., **101**, 993-1001
Nayak, G., Prentice, H.M. and Milton, S.L. (2009) *Role of neuroglobin in regulating reactive oxygen species in the brain of the anoxia-tolerant turtle Trachemys scripta* J. Neurochem., **110**, 603–612

Nayak, G.H., Prentice, H.M. and Milton, S.L. (2011) *Neuroprotective signaling pathways are modulated by adenosine in the anoxia tolerant turtle* J.Cereb. Blood Flow Metab., **31**, 467–475

4. Myelin removal from cell preparations

Crang, A.J., Gilson, J.M., Li, W.-W. and Blakemore, W.F. (2004) *The remyelinating potential and in vitro differentiation of MOG-expressing oligodendrocyte precursors isolated from the adult rat CNS* Eur. J. Neurosci., **20**, 1445-1460

Janes, K., Wahlman, C., Little, J.W., Doyle, T., Tosh, D.K., Jacobson, K.A. and Salvemini, D. (2015) *Spinal neuroimmune activation is independent of T-cell infiltration and attenuated by A3 adenosine receptor agonists in a model of oxaliplatin-induced peripheral neuropathy* Brain, Behav. Immun., **44** 91–99

Luyt, K., Varadi, A., Halfpenny, C.A., Scolding, N.J. and Molnar, E. (2004) *Metabotropic glutamate receptors are expressed in adult human glial progenitor cells* Biochem. Biophys. Res. Commun., **319**, 120-129

Mavrikis Cox, G., Kithcart, A.P., Pitt, D., Guan, Z., Alexander, J., Williams, J.L., Shawler, T., Dagia, N.M., Popovich, P.G., Satoskar, A.R. and Whitacre, C.C. (2013) *Macrophage migration inhibitory factor potentiates autoimmune-mediated neuroinflammation* J. Immunol., **191**, 1043–1054.

5. Neuroglial and other cells

Astrocytes

Eijkelkamp, N., Steen-Louws, C., Hartgring, S.A.Y., Willemen, H.L.D.M., Prado, J., Lafeber, F.P.J.G., Heijnen, C.J., Hack, C.E., van Roon, J.A.G. and Kavelaars, A. (2016) *IL4-10 Fusion protein is a novel drug to treat persistent inflammatory pain* J. Neurosci., **36**, 7353–7363

Freeman, K.A., Fullerton, D.A., Foley, L.S., Bell, M.T., Cleveland, Jr, J.C., Weyant, M.J. Mares, J. et al (2015) *Spinal cord protection via alpha-2 agonist-mediated increase in glial cell-line–derived neurotrophic factor* J. Thorac. Cardiovasc. Surg., **149**, 578-86

Kerstetter, A.E. and Miller, R.H. (2012) *Isolation and culture of spinal cord astrocytes* In Methods Mol. Biol., **814**, Astrocytes: Methods and Protocols (ed. Milner, R.) Springer Science+Business Media, LLC pp 93-104

Inflammatory cells

Mavrikis Cox, G., Kithcart, A.P., Pitt, D., Guan, Z., Alexander, J., Williams, J.L., Shawler, T., Dagia, N.M., Popovich, P.G., Satoskar, A.R. and Whitacre, C.C. (2013) *Macrophage migration inhibitory factor potentiates autoimmune-mediated neuroinflammation* J. Immunol., **191**, 1043–1054

Macrophages

Turtzo, L.C., Lescher, J., Janes, L., Dean, D.D., Budde, M.D. and Frank, J.A. (2014) *Macrophagic and microglial responses after focal traumatic brain injury in the female rat* J. Neuroinflam., **11**: 82

Microglial cells

Beck, K.D., Nguyen, H.X., Galvan, M.D., Salazar, D.L., Woodruff, T.M. and Anderson, A.J. (2010) *Quantitative analysis of cellular inflammation after traumatic spinal cord injury: evidence for a multiphasic inflammatory response in the acute to chronic environment* Brain **133**, 433–447

Bell, M.T., Puskas, F., Agoston, V.A., Cleveland, Jr, J.C., Freeman, K.A., Gamboni, F., Herson, P.S., Meng, X. and Smith, P.D. (2013) *Toll-like receptor 4–dependent microglial activation mediates spinal cord ischemia–reperfusion injury* Circulation, **128** [suppl 1], S152-S156

Bettinger, I., Thanos, S. and Paulus, W. (2002) *Microglia promote glioma migration* Acta Neuropathol., **103**, 351-355

Galvan, M.D., Luchetti, S., Burgos, A.M., Nguyen, H.X., Hooshmand, M.J., Hamers, F.P.T. and Anderson, A.J. (2008) *Deficiency in complement C1q improves histological and functional locomotor outcome after spinal cord injury* J. Neurosci., **28**, 13876 –13888

Hong, H-B., Krause, H.J., Sohn, S-W., Baik, T-K., Park, J.H., Shin, S-W., Park, C-H. and Song, D-Y. (2014) *In situ measurement of superoxide and hydroxyl radicals by frequency mixing detection technique* Anal. Biochem., **447**, 141-145

Mariani, A., Fanelli, R., Re Depaolini, A. and De Paola, M. (2015) *Decabrominated diphenyl ether and methylmercury impair fetal nervous system development in mice at documented human exposure levels*. Develop. Neurobiol., **75**, 23–38

Mavrikis Cox, G., Kithcart, A.P., Pitt, D., Guan, Z., Alexander, J., Williams, J.L., Shawler, T., Dagia, N.M., Popovich, P.G., Satoskar, A.R. and Whitacre, C.C. (2013) *Macrophage migration inhibitory factor potentiates autoimmune-mediated neuroinflammation* J. Immunol., **191**, 1043–1054

O'Mahony, A., Raber, J., Montano, M., Foehr, E., Han, V., Lu, S-m., Goethals, S., Ydens, E., Timmerman, V. and Janssens, S. (2010) *Toll-like receptor expression in the peripheral nerve* Glia, **58**, 1701–1709

Kwon, H., LeFevour, A., Chakraborty-Sett, S. and Greene, W.C. (2006) *NF-κB/Rel regulates inhibitory and excitatory neuronal function and synaptic plasticity* Mol. Biol. Cell., **26**, 7283-7298
Papa, S., Rossi, F., Ferrari, R., Mariani, A., De Paola, M., Caron, I., Fiordaliso, F., Bisighini, C., Sammali, E., Colombo, C., Gobbi, M., Canovi, M., Lucchetti, J., Peviani, M., Morbidelli, M., Forloni, G., Perale, G., Moscatelli, D. and Veglianese, P. (2013) *Selective nanovector mediated treatment of activated proinflammatory microglia/macrophages in spinal cord injury* ACS Nano, **7,** 9881–9895
Papa, S., Ferrari, R., De Paola, M., Rossi, F., Mariani, A., Caron, I., Sammali, E., Peviani, M., Dell'Oro, V., Colombo, C., Morbidelli, M., Forloni, G., Perale, G., Moscatelli, D. and Veglianese, P. (2014) *Polymeric nanoparticle system to target activated microglia/macrophages in spinal cord injury* J. Control. Release, **174,** 15-26
Papa, S., Caron, I., Erba, E., Panini, N., De Paola, M., Mariani, A., Colombo, C., Ferrari, R., Pozzer, D. et al (2016) *Early modulation of pro-inflammatory microglia by minocycline loaded nanoparticles confers long lasting protection after spinal cord injury* Biomaterials, **75**, 13-24
Song, D-Y., Yu, H-N., Park, C-R., Lee, J-S., Lee, J-Y., Park, B-G., Woo, R-S., Han, J-T., Cho, B-P. and Baik, T-K. (2013) *Down-regulation of microglial activity attenuates axotomized nigral dopaminergic neuronal cell loss* BMC Neurosci., **14**: 112
Tsuchiya, T., Park, K.C., Toyonaga, S., Yamada, S.M., Nakabayashi, H., Nakai, E., Ikawa, N., Furuya, M., Tominaga, A. and Shimizu, K. (2005) *Characterization of microglia induced from mouse embryonic stem cells and their migration into brain parenchyma* J. Neuroimmunol., **160**, 210-218
Tucsek, Z., Toth, P., Sosnowska, D., Gautam, T., Mitschelen, M., Koller, A., Szalai, G., Sonntag, W.E., Ungvari, Z. and Csiszar, A. (2014) *Obesity in aging exacerbates blood-brain barrier disruption, neuroinflammation, and oxidative stress in the mouse hippocampus: effects on expression of genes involved in beta-amyloid generation and Alzheimer's disease* J. Gerontol. A Biol. Sci. Med..Sci., **69**, 1212–1226
Turtzo, L.C., Lescher, J., Janes, L., Dean, D.D., Budde, M.D. and Frank, J.A. (2014) *Macrophagic and microglial responses after focal traumatic brain injury in the female rat* J. Neuroinflam., **11**: 82
Vincent, A.M. and Feldman, E.L. (2010) *Primary sensory and motor neuron cultures* In, Protocols for Neural Cell Culture, Springer Protocols Handbooks, (ed. Doering, L.C.), Humana Press (Springer Science+Business Media), Totowa, NJ. pp 161-173
Yang, B., Parsha, K., Migliati, E. and Savitz, S. (2014) *Bone marrow mononuclear cells may enhance recovery after stroke by modulating the microglial response* Stroke, **45**, Abstr. A192

Oligodendrocytes

Cassiani-Ingoni, R., Greenstone, H.L., Donati, D., Fogdell-Hahn, A., Martinell, E., Refai, D., Martin, R., Berger, E.A. and Jacobson, S. (2005) *CD46 on glial cells can function as a receptor for viral glycoprotein-mediated cell–cell fusion* Glia, **52**, 252-258
Chari, D.M., Phil, A., Crang, A.J. and Blakemore, W.F. (2003) *Decline in rate of colonization of oligodendrocyte progenitor cell (OPC)-depleted tissue by adult OPCs with age* J. Neuropathol. Exp. Neurol., **62**, 908-816
Li, G., Crang, A.J., Rundle, J.L. and Blakemore, W.F. (2002) *Oligodendrocyte progenitor cells in the adult rat CNS express myelin oligodendrocyte glycoprotein (MOG)* Brain Pathol., **12**, 463-471
O'Mahony, A., Raber, J., Montano, M., Foehr, E., Han, V., Lu, S-m., Kwon, H., LeFevour, A., Chakraborty-Sett, S. and Greene, W.C. (2006) *NF-κB/Rel regulates inhibitory and excitatory neuronal function and synaptic plasticity* Mol. Biol. Cell., **26**, 7283-7298
Sotnikov, I., Veremeyko, T., Starossom, S.C., Barteneva, N., Weiner, H.L. and Ponomarev, E.D. (2013) *Platelets recognize brain-specific glycolipid structures, respond to neurovascular damage and promote neuroinflammation* PLoS One, **8**: e58979

Mini-Review MC07: 4th edition, November 2016

Alere Technologies AS

Axis-Shield Density Gradient Media
is a brand of Alere Technologies AS