OptiPrep™ Mini-Review MC07

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**.

1. Methodology

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. et al (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. et al (2015) *Defects in optineurin- and myosin VI-mediated cellular trafficking in amyotrophic lateral sclerosis* Hum. Mol. Genet., **24**, 3830–3846

Human fetal brain

Ataman, B., Boulting, G.L., Harmin, D.A., Yang, M.G., Baker-Salisbury, M., Yap, E-L., Malik, A.N., Mei, K., Rubin, A.A. et al (2016) *Evolution of Osteocrin as an activityregulated factor in the primate brain* Nature, **539**, 242-247

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. et al (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. et al (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. et al (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. et al (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. et al (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. et al (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
Parker, K., Berretta, A., Saenger, S., Sivaramakrishnan, M., Shirley, S.A., Metzger, F. and Clarkson, A.N. (2017) *PEGylated insulin-like growth factor-I affords protection and facilitates recovery of lost functions post-focal ischemia* Sci. Rep., **7:** 241

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. et al (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

Ives, A.M. and Bertke, A.S. (2017) *Stress hormones epinephrine and corticosterone selectively modulate herpes simplex virus 1 (HSV-1) and HSV-2 productive infections in adult sympathetic, but not sensory neurons* (2017) J. Virol., **91**: e00582-17

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

Zhang, Y., Dai, J., Tang, J., Zhou, L. and Zhou, M. (2017) *MicroRNA-649 promotes HSV-1 replication by directly targeting MALT1* J. Med. Virol., **89**, 1069–1079

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 embryo ventral midbrain

Miller, N., Shi, H., Zelikovich, A.S. and Ma, Y-C. (2016) *Motor neuron mitochondrial dysfunction in spinal muscular atrophy* Hum.Mol. Genet., **25**, 3395–3406

Mouse spinal cord (adult)

Benoy, V., Vanden Berghe, P., Jarpe, M., Van Damme, P., Robberecht, W. and Van Den Bosch, L. (2017) *Development of improved HDAC6 inhibitors as pharmacological therapy for axonal Charcot–Marie–tooth disease* Neurotherapeutics, **14**, 417–428

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. et al (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

Rotem, N., Magen, I., Ionescu, A., Gershoni-Emek, N., Altman, T., Costa, C.J., Gradus, T., Pasmanik-Chor, M. et al (2017) *ALS along the axons – expression of coding and noncoding RNA differs in axons of ALS models* Sci. Rep., **7**: 44500
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
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 inhibit motoneuron death in cultures from ALS mouse model* Pharmacol. Res., **103**, 180–187
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