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**REVIEW ARTICLES**

**1837** Purinergic signaling in peripheral nervous system glial cells

*Jennifer Patritti-Cram, Robert A. Coover, Michael P. Jankowski, and Nancy Ratner*

**MAIN POINTS:**
- SC purinergic receptors are implicated in suppressing SC proliferation, increasing SC differentiation and elevating intracellular Ca2+ during nerve development in response to injury and/or in disease.
- P1R, P2XR, and P2YR receptors expressed in SCs and adjacent neurons need further study.

![Purinergic Receptors in Peripheral Nerve Glia](image)

**1852** Reactive astrocytes as treatment targets in Alzheimer’s disease—Systematic review of studies using the APPswePS1dE9 mouse model

*Tamar Smit, Natasja A. C. Deshayes, David R. Borchelt, Willem Kamphuis, Jinte Middeldorp, and Elly M. Hol*

**MAIN POINTS:**
- The APPswePS1dE9 mouse displays extensive amyloid-induced reactive astrogliosis.
- Reactive astrocytes play a pivotal role in AD pathogenesis as they affect synaptic function.
- Targeting reactive astrocytes may help to prevent cognitive decline.
RESEARCH ARTICLES

1882 Investigating oligodendrocyte connexins: Heteromeric interactions between Cx32 and mutant or wild-type forms of Cx47 do not contribute to or modulate gap junction function
Charles K. Abrams, Rafael E. Flores-Obando, Gabriel D. Dungan, Elina Cherepanova, and Mona M. Freidin
MAIN POINTS:
• Heteromeric hemichannels containing oligodendrocyte connexins Cx47 and Cx32 do not participate in gap junction formation.
• Thus, interactions between Cx32 and mutant forms of Cx47 are unlikely to contribute to disease severity.

1897 Glial Synaptobrevin mediates peripheral nerve insulation, neural metabolic supply, and is required for motor function
Mathias A. Böhme, Anthony W. McCarthy, Natalie Blaum, Monika Berezeckaja, Kristina Ponimaskine, David Schwefel, and Alexander M. Walter
MAIN POINTS:
• Glial TeNT-LC targets non-neuronal Synaptobrevin (Syb) and disrupts peripheral nerves and causes paralysis.
• Syb promotes nerve insulation by septate junction formation in subperineurial glia.
• Syb ensures neural metabolic supply in wrapping glia.

1916 Co-culture of exogenous oligodendrocytes with unmyelinated cerebella: Revisiting ex vivo models and new tools to study myelination
Lucas Baudouin, Noémie Adès, Kadja Kanté, Antonny Czarnecki, Corinne Bachelin, Asha Baskaran, Dominique Langui, Aymeric Millécamps, Basile Gurchenkov, Yoan Velut, Kévin Duarte, Jean-Vianney Barnier, Brahim Nait Oumesmar, and Lamia Bouslama-Oueghlani
MAIN POINTS:
• OPCs transplanted on cerebellar slices, depleted of their endogenous OLs, differentiate and form myelin.
• Exogenous myelin is compact and has the same thickness as the endogenous.
• Exogenous myelination adopts the same pattern as the endogenous.
Transcriptome of microglia reveals a species-specific expression profile in bovines with conserved and new signature genes
Leticia Tavares-Gomes, Camille Monney, Géraldine Neuhaus, David Francisco, Diana Solis, Artur Summerfield, Daniel Erny, Vidhya Jagannathan, and Anna Oevermann

MAIN POINTS:
- P2RY12 but not TMEM119, is a bovine microglial signature gene.
- F13A1 is a signature gene of monocytes and MDM.
- Microglia downregulates signature genes during culture but remains distinct from MDM by conserving TREM2, C1QC, GPR34, and APOE.

CHPG enhances BDNF and myelination in cuprizone-treated mice through astrocytic metabotropic glutamate receptor 5
Kyle S. Saitta, Lauren D. Lercher, Danielle M. Sainato, Ashish Patel, Yangyang Huang, Geoffrey McAuliffe, and Cheryl F. Dreyfus

MAIN POINTS:
- Intraperitoneal injection of CHPG stimulated mGluR5 on astrocytes to release BDNF and impact myelin within a lesion.
- BDNF from astrocytes directly affected oligodendrocytes.
- Stimulation of oligodendrocytes reversed deficits in myelination and behavior.

Effect of selectively knocking down key metabolic genes in Müller glia on photoreceptor health
Weiyong Shen, So-Ra Lee, Ashish Easow Mathai, Rui Zhang, Jianhai Du, Michelle X. Yam, Victoria Pye, Nigel L. Barnett, Cassie L. Rayner, Ling Zhu, James B. Hurley, Pankaj Seth, Yoshio Hirabayashi, Shigeki Furuya, and Mark C. Gillies

MAIN POINTS:
- Effect of selectively knocking down key metabolic genes in Müller glia on photoreceptor health
- Müller glia use glucose to produce serine to support photoreceptors.
- The lactate shuttle hypothesis may not reflect the metabolic relationship between Müller glia and photoreceptors in the retina.
1987  
Haploinsufficiency of microglial MyD88 ameliorates Alzheimer’s pathology and vascular disorders in APP/PS1-transgenic mice
Wenqiang Quan, Qinghua Luo, Wenlin Hao, Inge Tomic, Tomomi Furihata, Walter Schulz-Schafer, Michael D. Menger, Klaus Fassbender, and Yang Liu

MAIN POINTS:
- MyD88-deficient microglia reduce neuroinflammation and cerebral Aβ in APP-transgenic mice.
- MyD88-deficient microglia increase cerebral vasculature in APP-transgenic mice.
- MyD88-deficient microglia increase LRP1 at BBB of APP-transgenic mice.

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2006  
Microglia-mediated phagocytosis of apoptotic nuclei is impaired in the adult murine hippocampus after stroke
Max Rudolph, Christian W. Schmeer, Madlen Gunther, Florus Woitke, Carolin Kathner-Schaffert, Lina Karapetow, Julia Lindner, Thomas Lehmann, Gustav Jirikowski, Otto W. Witte, Christoph Redecker, and Silke Keiner

MAIN POINTS:
- Stroke reduces the number of phagocytic microglia in the dentate gyrus.
- Reduced microglia phagocytosis leads to a transient overload of apoptotic cells.
- Post-lesional microglia phagocytosis of newly born cell is not affected.

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2023  
Oligodendrocytes are susceptible to Zika virus infection in a mouse model of perinatal exposure: Implications for CNS complications
Verena Schultz, Jennifer A. Barrie, Claire L. Donald, Colin L. Crawford, Margaret Mullin, Thomas J. Anderson, Tom Solomon, Susan C. Barnett, Christopher Linnington, Alain Kohl, Hugh J. Willison, and Julia M. Edgar

MAIN POINTS:
- In a mouse model of perinatal Zika virus infection, oligodendrocytes are susceptible.
- NLRP3 expression is upregulated.
- Myelin defects may explain neurodevelopmental delays in congenitally infected infants who were asymptomatic at birth.
Nicotine induces morphological and functional changes in astrocytes via nicotinic receptor activity
Surya P. Aryal, Xu Fu, Joree N. Sandin, Khaga R. Neupane, Jourdan E. Lakes, Martha E. Grady, and Christopher I. Richards

MAIN POINTS:
- Nicotine induces time dependent remodeling in astrocytic processes via nicotinic acetylcholine receptors (nAChRs) activity.
- Long term nicotine exposure increases Ca²⁺ activity but does not cause reactive astrocytosis.
- Nicotine increases the volume of astrocytes in vivo.

Cover Illustration: Confocal image of a cerebellar slice depleted of its endogenous oligodendrocytes and transplanted with OPCs (oligodendrocyte precursor cells). Exogenous OPCs effectively differentiate and form myelin sheaths (MBP+, rainbow pseudo-color) around Purkinje cell axons (CaBP+, grey) after 3 days of co-culture. (See Bouslama-Oueghlani, L, et al, https://doi.org/10.1002/glia.24001.)

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