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Breaking the vicious cycle of epileptogenesis

Focus on brain inflammation and matrix metalloproteinases

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CHAPTER

11

List of publications

Published research articles

A.R. Malik, J. Lips, M. Gorniak-Walas, **D.W.M. Broekaart**, A. Asaro, M.T.C. Kuffner, C.J. Hoffmann, M. Kikhia, M. Dopatka, P. Boehm-Sturm, S. Mueller, U. Dirnagl, E. Aronica, C. Harms, T.E. Willnow. SorCS2 facilitates release of endostatin from astrocytes and controls post-stroke angiogenesis. *Glia*. 2020 Jan;1-13.

A. Korotkov, **D.W.M. Broekaart**, L. Banchaewa, B. Pustjens, J. van Scheppingen, J.J. Anink, J.C. Baayen, S. Idema, J.A. Gorter, E.A. van Vliet, E. Aronica. microRNA-132 is overexpressed in glia in temporal lobe epilepsy and reduces the expression of pro-epileptogenic factors in human cultured astrocytes. *Glia*. 2020 Jan;68(1):60-75.

D.W.M. Broekaart*, J. van Scheppingen*, J.J. Anink, L. Wierdsma, B. van Het Hof, F.E. Jansen, W.G. Spliet, P.C. van Rijen, W.W. Kamphuis, H.E. de Vries, E. Aronica, E.A. van Vliet. Increased matrix metalloproteinases expression in tuberous sclerosis complex: modulation by microRNA 146a and 147b *in vitro*. *Neuropathology and Applied Neurobiology*. 2020;46(2):142-159.

D.W.M. Broekaart, J.J. Anink, J.C. Baayen, S. Idema, H.E. de Vries, E. Aronica, J.A. Gorter, E.A. van Vliet. Activation of the innate immune system is evident throughout epileptogenesis and is associated with blood-brain barrier dysfunction and seizure progression. *Epilepsia*. 2018 Oct;59(10):1931-1944.

A. Korotkov*, **D.W.M. Broekaart***, J. van Scheppingen, J.J. Anink, J.C. Baayen, S. Idema, J.A. Gorter, E. Aronica, E.A. van Vliet. Increased expression of matrix metalloproteinase 3 can be attenuated by inhibition of microRNA-155 in cultured human astrocytes. *Journal of Neuroinflammation*. 2018 Jul 21;15(1):211.

J. van Scheppingen, J.D. Mills, T.S. Zimmer, **D.W.M. Broekaart**, V. Iori, A. Bongaarts, J.J. Anink, A.M. Iyer, A. Korotkov, F.E. Jansen, W. van Hecke, W.G. Spliet, P.C. van Rijen, J.C. Baayen, A. Vezzani, E.A. van Vliet, E. Aronica. miR147b: A novel key regulator of interleukin 1 beta-mediated inflammation in human astrocytes. *Glia*. 2018 May;66(5):1082-1097.

D.W.M. Broekaart*, J. van Scheppingen*, K.W. Geijtenbeek, M.R.J. Zuidberg, J.J. Anink, J.C. Baayen, A. Mühlebner, E. Aronica, J.A. Gorter, E.A. van Vliet. Increased expression of (immuno)proteasome subunits during epileptogenesis is attenuated by inhibition of the mammalian target of rapamycin pathway. *Epilepsia*. 2017 Aug;58(8):1462-1472.

J. van Scheppingen*, **D.W. Broekaart***, T. Scholl, M.R. Zuidberg, J.J. Anink, W.G. Spliet, P.C. van Rijen, T. Czeck, J.A. Hainfellner, M. Feucht, A. Mühlebner, E.A. van Vliet, E. Aronica. Dysregulation of the (immuno)proteasome pathway in malformations of cortical development. *Journal of Neuroinflammation*. 2016 Aug 26;13(1):202.

A. Tramutola, G. Pupo, F. Di Domenico, E. Barone, A. Arena, C. Lanzillotta, **D. Broekaart**, C. Blarzino, E. Head, D.A. Butterfield, M. Perluigi. Activation of p53 in Down Syndrome and in the Ts65Dn mouse brain is associated with a pro-apoptotic phenotype. *Journal of Alzheimer's Disease*. 2016;52(1):359-371.

Popular (non-)scientific writing

D. Broekaart, J. Gorter, E. Aronica, E. van Vliet. Herstel van lekkende bloedvaten in de hersenen als nieuwe therapie voor epilepsie? *Epilepsie, periodiek voor professionals (uitgave van Nederlandse Liga tegen Epilepsie)*. 2019; 17(3):6-8

Submitted research articles

A. Bongaarts*, J.M. de Jong*, **D.W. Broekaart***, J. van Scheppingen, J.J. Anink, C. Mijnsbergen, F.E. Jansen, W.G.M. Spliet, W.F.A. den Dunnen, V.E. Gruber, T. Scholl, J.A. Hainfellner, M. Feucht, J. Borkowska, K. Kotulska, S. Jozwiak, W. Grajkowska, A. Buccoliero, C. Caporalini, F. Giordano, L. Genitori, B.P. Scicluna, A.Y.N. Schouten-van Meeteren, E.A. van Vliet, A. Mühlebner, J.D. Mills, E. Aronica. Dysregulation of the MMP/TIMP proteolytic system in subependymal giant cell astrocytomas in patients with tuberous sclerosis complex: modulation of MMP by microRNA-320d in vitro. *Accepted, Journal of Neuropathology and Experimental Neurology*.

D.W.M. Broekaart*, A. Bertran*, S. Jia*, A. Korotkov, O. Senkov, A. Bongaarts, J.D. Mills, J.J. Anink, J. Seco, J.C. Baayen, S. Idema, E. Chabrol, A.J. Becker, W.J. Wadman, T. Tarragó, J.A. Gorter, E. Aronica, R. Prades, A. Dityatev, E.A. van Vliet. The novel matrix metalloproteinase inhibitor IPR-179 has disease-modifying effects in rodent models of epilepsy. *Submitted*

A. Korotkov, N. Puhakka, S. DasGupta, N. Vuokila, **D.W.M. Broekaart**, J.J. Anink, M. Heiskanen, J. Karttunen, J. van Scheppingen, I. Huitinga, J.D. Mills, E.A. van Vliet, A. Pitkänen, E. Aronica. Increased expression of miR142 and miR155 in glial and immune cells after traumatic brain injury may contribute to neuroinflammation via astrocyte activation. *Submitted*

F.S. Cho, I.D. Vainchtein, A.R. Morningstar, F. Aparicio, A. Ciesielska, **D.W.M. Broekaart**, J.J. Anink, E.A. van Vliet, E. Aronica, A.V. Molofsky, J.T. Paz. Reactive thalamic astrocytes modulate cortical rhythms via the GAT-3 GABA transporter. *Submitted*

Submitted book chapter

D.W.M. Broekaart, A. Korotkov, J.A. Gorter, E.A. van Vliet. Inflammation and epilepsy: New vistas, Eds D. Janigro, N. Marchi, A. Nehlig; chapter Perivascular inflammation and extracellular matrix alterations in blood-brain barrier dysfunction and epilepsy. *Submitted*

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