

Sabine Spijker

Full Professor

Molecular and Cellular Neurobiology

Amsterdam Neuroscience - Cellular & Molecular Mechanisms

Amsterdam Neuroscience - Compulsivity, Impulsivity & Attention

Amsterdam Neuroscience - Mood, Anxiety, Psychosis, Stress & Sleep

**Email:** s.spijker@vu.nl

**Web address:**

[https://mcn.cncr.nl/research\\_teams/animal\\_models\\_of\\_psychiatric\\_disease/](https://mcn.cncr.nl/research_teams/animal_models_of_psychiatric_disease/)



## Personal information

Please check my website for the focus of my research, recent papers, as well as internship eligibility and application procedure: [https://mcn.cncr.nl/research\\_teams/animal\\_models\\_of\\_psychiatric\\_disease/](https://mcn.cncr.nl/research_teams/animal_models_of_psychiatric_disease/)

## Personal information

Prof.dr. Sabine Spijker obtained a MSc in Molecular Neurobiology in 1994 and a PhD in Neuroscience at the VU University Amsterdam in 1999. She received post-doctoral training at the IGBMC in Strasbourg (EMBO long-term fellowship, Marie Curie), and at the VU University Amsterdam.

She was awarded a Vici grant from the Netherlands Organization for Scientific Research (NWO) in 2015 to expand on her research into the molecular basis of the maintained state of depression.

Currently she is interested in how stress becomes manifested as depression at the molecular and cellular level, focusing on deficits in learning and memory.

## Research outputs

### **Rasal1 regulates calcium dependent neuronal maturation by modifying microtubule dynamics**

Deurloo, M. H. S., Eide, S., Turlova, E., Li, Q., Spijker, S., Sun, H. S., Groffen, A. J. A. & Feng, Z. P., 21 Jan 2024, In: Cell and Bioscience. 14, p. 1-20 20 p., 13.

### **Interfering With Contextual Fear Memories by Post-reactivation Administration of Propranolol in Mice: A Series of Null Findings**

Cox, W. R., Faliagkas, L., Besseling, A., van der Loo, R. J., Spijker, S., Kindt, M. & Rao-Ruiz, P., 27 Jun 2022, In: Frontiers in Behavioral Neuroscience. 16, p. 1-19 19 p., 893572.

### **Interfering with contextual fear memories by post-reactivation administration of propranolol in mice: a series of null findings**

Cox, W., Faliagkas, L., Besseling, A., van der Loo, R. J., Spijker, S., Kindt, M. & Rao, P., 12 Mar 2022, In: bioRxiv. 2022, p. 1-48 48 p.

### **Auxiliary subunits of the AMPA: The Shisa family of proteins**

Abdollahi Nejat, M., Klaassen, R. V., Spijker, S. & Smit, A. B., Jun 2021, In: Current Opinion in Pharmacology. 58, p. 52-61 10 p.

### **Incubation of depression: ECM assembly and parvalbumin interneurons after stress**

Spijker, S., Koskinen, M. K. & Riga, D., Nov 2020, In: Neuroscience and Biobehavioral Reviews. 118, p. 65-79 15 p.

### **From stress to depression: development of extracellular matrix-dependent cognitive impairment following social stress**

Koskinen, M. K., van Mourik, Y., Smit, A. B., Riga, D. & Spijker, S., 14 Oct 2020, In: Scientific Reports. 10, p. 1-12 12 p., 17308.

### **Genetic Variation in CNS Myelination and Functional Brain Connectivity in Recombinant Inbred Mice**

Goudriaan, A., Loos, M., Spijker, S., Smit, A. B. & Verheijen, M. H. G., 18 Sept 2020, In: Cells. 9, 9, p. 1-16 2130.

### **Dysregulated Prefrontal Cortex Inhibition in Prepubescent and Adolescent Fragile X Mouse Model**

Kramvis, I., van Westen, R., Lammertse, H. C. A., Riga, D., Heistek, T. S., Loebel, A., Spijker, S., Mansvelder, H. D. & Meredith, R. M., 26 May 2020, In: Frontiers in Molecular Neuroscience. 13, May, p. 1-16 16 p., 88.

**AMPA Auxiliary Protein SHISA6 Facilitates Purkinje Cell Synaptic Excitability and Procedural Memory Formation**

Peter, S., Urbanus, B. H. A., Klaassen, R. V., Wu, B., Boele, H. J., Azizi, S., Slotman, J. A., Houtsmuller, A. B., Schonewille, M., Hoebeek, F. E., Spijker, S., Smit, A. B. & De Zeeuw, C. I., 14 Apr 2020, In: *Cell Reports*. 31, 2, 107515.

**Stress vulnerability promotes an alcohol-prone phenotype in a preclinical model of sustained depression**

Riga, D., Schmitz, L. J. M., van Mourik, Y., Hoogendijk, W. J. G., De Vries, T. J., Smit, A. B. & Spijker, S., Jan 2020, In: *Addiction Biology*. 25, 1, p. 1-12 12 p., e12701.

**Gpr158 Deficiency Impacts Hippocampal CA1 Neuronal Excitability, Dendritic Architecture, and Affects Spatial Learning**

Çetereisi, D., Kramvis, I., Gebuis, T., van der Loo, R. J., Gouwenberg, Y., Mansvelder, H. D., Li, K. W., Smit, A. B. & Spijker, S., 25 Oct 2019, In: *Frontiers in Cellular Neuroscience*. 13, OCTOBER, p. 1-18 18 p., 465.

**A Potential Role for the STXBP5-AS1 Gene in Adult ADHD Symptoms**

The EAGLE-ADHD Consortium, 15 May 2019, In: *Behavior Genetics*. 49, 3, p. 270-285 16 p.

**Dissection of rodent brain regions: Guided free-hand slicing and dissection of frozen tissue**

Spijker, S., Faliagkas, L. & Rao-Ruiz, P., 2019, *Neuroproteomics*. Li, K. W. (ed.). 2nd ed. Humana Press Inc., p. 7-19 13 p. (Neuromethods; vol. 146).

**Noelin1 Affects Lateral Mobility of Synaptic AMPA Receptors**

Pandya, N. J., Seeger, C., Babai, N., Gonzalez-Lozano, M. A., Mack, V., Lodder, J. C., Gouwenberg, Y., Mansvelder, H. D., Danielson, U. H., Li, K. W., Heine, M., Spijker, S., Frischknecht, R. & Smit, A. B., 31 Jul 2018, In: *Cell Reports*. 24, 5, p. 1218-1230 13 p.

Erratum: Correction: The AMPA receptor-associated protein Shisa7 regulates hippocampal synaptic function and contextual memory (*eLife* (2017) 6 PII: e36711)

Schmitz, L. J. M., Klaassen, R. V., Ruiperez-Alonso, M., Zamri, A. E., Stroeder, J., Rao-Ruiz, P., Lodder, J. C., van der Loo, R. J., Mansvelder, H. D., Smit, A. B. & Spijker, S., 4 May 2018, In: *eLife*. 7, e36711.

**The caudal part of the posterior insula of rats participates in the maintenance but not the acquisition of morphine conditioned place preference**

Sun, Y. M., Chen, R. X., Li, Z. F., Spijker, S., Zhai, R. W. & Yang, S. C., May 2018, In: *CNS Neuroscience and Therapeutics*. 24, 5, p. 420-428 9 p.

**Constitutive loss and acute pharmacological manipulation of ErbB4 signaling do not affect attention and inhibitory control in mice**

Marchisella, E., Wijnands, R., Koopmans, B., Spijker, S. & Loos, M., Jan 2018, In: *Genes, Brain and Behavior*. 17, 1, p. 56-69 14 p.

**The AMPA receptor-associated protein Shisa7 regulates hippocampal synaptic function and contextual memory**

Schmitz, L. J. M., Klaassen, R. V., Ruiperez-Alonso, M., Zamri, A. E., Stroeder, J., Rao-Ruiz, P., Lodder, J. C., van der Loo, R. J., Mansvelder, H. D., Smit, A. B. & Spijker, S., 4 Dec 2017, In: *eLife*. 6, p. 1-28 28 p., e24192.

**Hippocampal extracellular matrix alterations contribute to cognitive impairment associated with a chronic depressive-like state in rats**

Riga, D., Kramvis, I., Koskinen, M. K., van Bokhoven, P., van der Harst, J. E., Heistek, T. S., Jaap Timmerman, A., van Nierop, P., van der Schors, R. C., Pieneman, A. W., de Weger, A., van Mourik, Y., Schoffemeer, A. N. M., Mansvelder, H. D., Meredith, R. M., Hoogendijk, W. J. G., Smit, A. B. & Spijker, S., Dec 2017, In: *Science Translational Medicine*. 9, 421, p. 1-12 12 p., eaai8753.

**Temporal profiling of depression vulnerability in a preclinical model of sustained depression**

Riga, D., Schmitz, L. J. M., Hoogendijk, W. J. G., Smit, A. B. & Spijker, S., 17 Aug 2017, In: *Scientific Reports*. 7, 1, p. 8570 8570.

**Stable immediate early gene expression patterns in medial prefrontal cortex and striatum after long-term cocaine self-administration.**

Gao, P., Limpens, J. H., Spijker, S., Vanderschuren, L. J. & Voorn, P., Mar 2017, In: *Addiction Biology*. 22, 2, p. 354-368 15 p.

**Complex Genetics of Behavior: BXDs in the Automated Home-Cage**

Loos, M., Verhage, M., Spijker, S. & Smit, A. B., 2017, *Systems Genetics: Methods and Protocols*. Schughart, K. & Williams, R. W. (eds.). Humana Press, p. 519-530 12 p. (Methods in Molecular Biology; vol. 1488).

**Prefrontal cortical neuregulin-ErbB modulation of inhibitory control in rats**

Loos, M., Schettters, D., Hoogeland, M., Spijker, S., de Vries, T. J. & Pattij, T., 15 Jun 2016, In: *European Journal of Pharmacology*. 781, p. 157-63 7 p.

**Impact of genetic variation on synaptic protein levels in genetically diverse mice**

Loos, M., Li, K. W., van der Schors, R. C., Gouwenberg, Y., Loo, R. J., Williams, R. W., Smit, A. B. & Spijker, S., Apr 2016, In: *Proteomics*. 16, 7, p. 1123-30 8 p.

**Presynaptic inhibition upon CB1 or mGlu2/3 receptor activation requires ERK/MAPK phosphorylation of Munc18-1.**

Schmitz, S. K., King, C., Kortleven, C. A., Huson, V. W. J., Kroon, T., Kevenaer, J. T., Schut, D., Saarloos, I., Hoetjes, J. P., de Wit, H., Stiedl, O., Spijker, S., Li, K. W., Mansvelder, H. D., Smit, A. B., Cornelisse, L. N., Verhage, M. & Toonen, R. F. G., 2016, In: *EMBO Journal*. 35, p. 1236-1250 11.

**Shisa6 traps AMPA receptors at postsynaptic sites and prevents their desensitization during synaptic activity.**

Klaassen, R. V., Stroeder, J., Coussen, F., Hafner, A. S., Petersen, J. D., Renancio, C., Schmitz, L. J., Normand, E., Lodder, J. C., Rotaru-Marcu, D. C., Rao-Ruiz, P., Spijker, S., Mansvelder, H. D., Choquet, D. & Smit, A. B., 2016, In: *Nature Communications*. 7, 1, 10682.

**The Extracellular Matrix Protein Brevican Limits Time-Dependent Enhancement of Cocaine Conditioned Place Preference**

Lubbers, B. R., Matos, R. M., Horn, A., Visser, E., Loo, R. J., Gouwenberg, Y., Meerhoff, G. F., Frischknecht, R., Seidenbecher, C. I., Smit, A. B., Spijker, S. & van den Oever, M. C., 2016, (Accepted/In press) In: *Neuropsychopharmacology*.

**Migraine mutations impair hippocampal learning despite enhanced long-term potentiation.**

Dilekoz, E., Houben, T., Eikermann-Harterter, K., Balkaya, M., Lenselink, A. M., Whalen, M. J., Spijker, S., Ferrari, M. D., van den Maagdenberg, A. M. J. M. & Ayate, C., 2015, In: *The Journal of Neuroscience*. 35, 8, p. 3397-3402

**Social defeat-induced anhedonia: effects on operant sucrose-seeking behavior**

Riga, D., Theijs, J. T., de Vries, T. J., Smit, A. B. & Spijker, S., 2015, In: *Frontiers in Behavioral Neuroscience*. 9, 195.

**Strain Differences in Presynaptic Function: Proteomics, Ultrastructure, and Physiology of Hippocampal Synapses in DBA/2J AND C57Bl/6J mice..**

Lenselink, A. M., Rotaru-Marcu, D. C., Li, K. W., van Nierop, P., Rao-Ruiz, P., Loos, M., van der Schors, R. C., Gouwenberg, Y., Wortel, J., Mansvelder, H. D., Smit, A. B. & Spijker, S., 2015, In: *Journal of Biological Chemistry*. 290, 25, p. 15635-15645

**Time-dependent changes in the mouse hippocampal synaptic membrane proteome after contextual fear conditioning.**

Rao-Ruiz, P., Carney, K. E., Pandya, N. J., Loo, R. J., Verheijen, M. H. G., van Nierop, P., Smit, A. B. & Spijker, S., 2015, In: *Hippocampus*. 25, 11, p. 1250-1261

**A Sustained Depressive State Promotes a Guanfacine Reversible Susceptibility to Alcohol Seeking in Rats**

Riga, D., Schmitz, L. J. M., van der Harst, J. E., van Mourik, Y., Hoogendijk, W. J. G., Smit, A. B., de Vries, T. J. & Spijker, S., 2014, In: *Neuropsychopharmacology*. 39, 5, p. 1115-1124

### **C-terminal interactors of the AMPA receptor auxiliary subunit Shisa9.**

Karataeva, A. R., Klaassen, R. V., Ruiperez-Alonso, M., Hjorth, J., van Nierop, P., Spijker, S., Mansvelder, H. D. & Smit, A. B., 2014, In: PLoS ONE. 9, 2, p. e87360 e87360.

### **Identification of Srp9 as a febrile seizure susceptibility gene**

Hessel, E. V., de Wit, M., Karst, H., de Graaff, E., van Lith, H. A., de Bruijn, E., de Sonnaville, S., Verbeek, N. E., Lindhout, D., de Kovel, C. G., Koeleman, B.P., van Kempen, M., Brilstra, E., Cuppen, E., Loos, M., Spijker, S., Kan, A. A., Baars, S. E., van Rijen, P. C., Gosselaar, P. H., & 13 others Groot Koerkamp, M. J., Holstege, F. C. P., van Duijn, C., Vergeer, J., Moll, H. A., Tauboll, E., Heuser, K., Ramakers, G. M., Pasterkamp, R. J., van Nieuwenhuizen, O., Hoogenraad, C. C., Kas, M. J. & de Graan, P. N. E., 2014, In: Annals of Clinical and Translational Neurology. 1, 4, p. 239-250

### **Impulsivity and comorbid traits: a multi-step approach for finding putative responsible microRNAs in the amygdala**

Pietrzykowski, A. Z. & Spijker, S., 2014, In: Frontiers in Neuroscience. 8, p. 389 389.

### **Langdurige depressie leidt tot verhoogde kwetsbaarheid voor alcoholzoekgedrag**

Spijker, S., 2014, In: Tijdschrift voor Psychiatrie. 56, 11, p. 755 755.

### **Neural ECM in addiction, schizophrenia, and mood disorder**

Lubbers, B. R., Smit, A. B., Spijker, S. & van den Oever, M. C., 2014, In: Progress in Brain Research. 214, p. 263-284

### **Neuregulin-3 in the mouse medial prefrontal cortex regulates impulsive action**

Loos, M., Mueller, T., Gouwenberg, Y., Wijnands, R., Loo, R. J., Birchmeier, C., Smit, A. B. & Spijker, S., 2014, In: Biological Psychiatry. 76, 8, p. 648-655

### **Optogenetic dissection of medial prefrontal cortex circuitry**

Riga, D., Matos, R. M., Glas, A., Smit, A. B., Spijker, S. & van den Oever, M. C., 2014, In: Frontiers in Systems Neuroscience. 8, p. 230 230.

### **Prefrontal gamma-aminobutyric Acid type a receptor insertion controls cue-induced relapse to nicotine seeking**

Lubbers, B. R., van Mourik, Y., Schettters, D., Smit, A. B., de Vries, T. J. & Spijker, S., 2014, In: Biological Psychiatry. 76, 9, p. 750-758

### **Behavioral evidence for photophobia and stress-related ipsilateral head pain in transgenic Cacna1a mutant mice**

Chanda, M. L., Tuttle, A. H., Baran, I., Atlin, C., Guindi, D., Hathaway, G., Israelian, N., Levenstadt, J., Low, D., Macrae, L., O'Shea, L., Silver, A., Zendegui, E., Lenselink, A. M., Spijker, S., Ferrari, M. D. & Mogil, J. S., 2013, In: Pain. 154, 8, p. 1254-1262

### **Enhanced alcohol self-administration and reinstatement in a highly impulsive, inattentive recombinant inbred mouse strain**

Loos, M., Staal, J. I., Smit, A. B., de Vries, T. J. & Spijker, S., 2013, In: Frontiers in Behavioral Neuroscience. 7, p. 151 10 p., 151.

### **Min of meer vergeten**

Spijker, S., 2013, Amsterdam: Vrije Universiteit.

### **Adolescent nicotine exposure transiently increases high-affinity nicotinic receptors and modulates inhibitory synaptic transmission in rat medial prefrontal cortex.**

Counotte, D. S., Goriounova, N. A., Moretti, M., Smoluch, M. T., Irth, H., Clementi, F., Schoffemeer, A. N. M., Mansvelder, H. D., Smit, A. B., Gotti, C. & Spijker, S., 2012, In: FASEB Journal. 26, 5, p. 1810-1820 10 p.

### **A novel QTL underlying early-onset, low-frequency hearing loss in BXD recombinant inbred strains**

Nagtegaal, A. P., Spijker, S., Crins, T. T. H. & Borst, J. G. G., 2012, In: Genes, Brain and Behavior. 11, 8, p. 911-920

### **Distinct gene loci control the host response to influenza H1N1 virus infection in a time-dependent manner**

Nedelko, T., Kollmus, H., Klawonn, F., Spijker, S., Lu, L., Hessman, M., Alberts, R., Williams, R. W. & Schughart, K., 2012, In: BMC Genomics. 13, p. 411-411 1 p.

**Independent genetic loci for sensorimotor gating and attentional performance in BXD recombinant inbred strains**

Loos, M., Staal, J. I., Pattij, T., Smit, A. B., Spijker, S. & Verhage, M., 2012, In: *Genes, Brain and Behavior*. 11, 2, p. 147-156

**The synaptic pathology of drug addiction**

van den Oever, M. C., Spijker, S. & Smit, A. B., 2012, In: *Advances in Experimental Medicine and Biology*. 970, p. 469-491 33 p.

**The Yin and Yang of Nicotine: Harmful during Development, Beneficial in Adult Patient Populations**

Counotte, D. S., Smit, A. B. & Spijker, S., 2012, In: *Frontiers in Pharmacology*. 3, UNSP 180.

**Development of the motivational system during adolescence, and its sensitivity to disruption by nicotine**

Counotte, D. S., Smit, A. B., Pattij, T. & Spijker, S., 2011, In: *Developmental Cognitive Neuroscience*. 1, 4, p. 430-443

**Dissection of Rodent Brain Regions**

Spijker, S., 2011, *Neuroproteomics*. Li, K. W. (ed.). New York/Heidelberg: Humana Press, p. 23-26 317 p. (Neuromethods; no. 57).

**Expression QTL mapping in regulatory and helper T cells from the BXD family of strains reveals novel cell-specific genes, gene-gene interactions and candidate genes for auto-immune disease**

Alberts, R., Chen, H., Pemmerenke, C., Smit, A. B., Spijker, S., Williams, R. W., Geffers, R., Bruder, D. & Schughart, K., 2011, In: *BMC Genomics*. 12, p. 610-610 1 p.

**Lasting synaptic changes underlie attention deficits caused by nicotine exposure during adolescence**

Counotte, D. S., Goriounova, N. A., Li, K. W., Loos, M., van der Schors, R. C., Schetters, D., Schoffelmeer, A. N. M., Smit, A. B., Mansvelder, H. D., Pattij, T. & Spijker, S., 2011, In: *Nature Neuroscience*. 14, 4, p. 417-419 2 p.

**Nicotinic acetylcholine receptor  $\beta 2$ -subunits in the medial prefrontal cortex control attention**

Guillem, K., Bloem, B., Poorthuis, R. B., Loos, M., Smit, A. B., Maskos, U., Spijker, S. & Mansvelder, H. D., 2011, In: *Science*. 333, p. 888-891 3 p.

**Novel Candidate Genes Associated with Hippocampal Oscillations**

Jansen, R., Timmerman, J., Loos, M., Spijker, S., van Ooijen, A., Brussaard, A. B., Mansvelder, H. D., Smit, A. B., de Gunst, M. C. M. & Linkenkaer-Hansen, K., 2011, In: *PLoS ONE*. 6, 10, e26586.

**Proteomics, ultrastructure, and physiology of hippocampal synapses in a fragile X syndrome mouse model reveal presynaptic phenotype**

Klemmer, P., Meredith, R. M., Holmgren, C. D., Klychnikov, O. I., Stahl-Zeng, J., Loos, M., van der Schors, R. C., Wortel, J., de Wit, H., Spijker, S., Rotaru, D. C., Mansvelder, H. D., Smit, A. B. & Li, K. W., 2011, In: *Journal of Biological Chemistry*. 286, 29, p. 25495-25504 9 p.

**Reduction in hippocampal neurogenesis after social defeat is long-lasting and responsive to late antidepressant treatment**

van Bokhoven, P., Oomen, C. A., Hoogendijk, W. J. G., Smit, A. B., Lucassen, P. J. & Spijker, S., 2011, In: *European Journal of Neuroscience*. 33, 10, p. 1833-1840

**Retrieval-specific endocytosis of GluA2-AMPA receptors underlies adaptive reconsolidation of contextual fear**

Rao-Ruiz, P., Rotaru, D. C., Loo, R. J., Mansvelder, H. D., Stiedl, O., Smit, A. B. & Spijker, S., 2011, In: *Nature Neuroscience*. 14, 10, p. 1302-1308 6 p.

**Dopamine receptor D1/D5 gene expression in the medial prefrontal cortex predicts impulsive choice in rats.**

Loos, M., Pattij, T., Janssen, M. C., Counotte, D. S., Schoffelmeer, A. N., Smit, A. B., Spijker, S. & van, G. M. M., May 2010, In: *Cerebral cortex (New York, N.Y. : 1991)*.

**Changes in molecular composition of rat medial prefrontal cortex synapses during adolescent development**

Counotte, D. S., Li, K. W., Wortel, J., Gouwenberg, Y., van der Schors, R. C., Smit, A. B. & Spijker, S., 2010, In: European Journal of Neuroscience. 32, 9, p. 1452-1460

**Dopamine Receptor D-1/D-5 Gene Expression in the Medial Prefrontal Cortex Predicts Impulsive Choice in Rats**

Loos, M., Pattij, T., Janssen, M. C. W., Counotte, D. S., Schoffemeer, A. N. M., Smit, A. B., Spijker, S. & van Gaalen, M. M., 2010, In: Cerebral Cortex. 20, 5, p. 1064-1070

**Extracellular matrix plasticity and GABAergic inhibition of prefrontal cortex pyramidal cells facilitates relapse to heroin seeking**

van den Oever, M. C., Lubbers, B. R., Goriounova, N. A., Li, K. W., van der Schors, R. C., Loos, M., Riga, D., Wiskerke, J., Binnekade, R., Stegeman, M., Schoffemeer, A. N., Mansvelder, H. D., Smit, A. B., de Vries, T. J. & Spijker, S., 2010, In: Neuropsychopharmacology. 35, 10, p. 2120-2133 13 p.

**GABAergic synapse properties may explain genetic variation in hippocampal network oscillations in mice**

Heistek, T. S., Timmerman, A. J., Spijker, S., Brussaard, A. B. & Mansvelder, H. D., 2010, In: Frontiers in Cellular Neuroscience. 4, p. 18 11 p.

**Inhibitory control and response latency differences between C57BL/6J and DBA/2J mice in a Go/No-Go and 5-choice serial reaction time task and strain-specific responsivity to amphetamine**

Loos, M., Staal, J., Schoffemeer, A. N. M., Smit, A. B., Spijker, S. & Pattij, T., 2010, In: Behavioural Brain Research. 214, 2, p. 216-224

**Prefrontal cortex plasticity mechanisms in drug seeking and relapse**

van den Oever, M. C., Spijker, S., Smit, A. B. & de Vries, T. J., 2010, In: Neuroscience and Biobehavioral Reviews. 35, 2, p. 276-284

**Quantitative cortical synapse proteomics of a transgenic migraine mouse model with mutated Ca(v)2.1 calcium channels**

Klychnikov, O. I., Li, K. W., Sidorov, I. A., Loos, M., Spijker, S., Broos, L. A. M., Frants, R. R., Ferrari, M. D., Mayboroda, O. A., Deelder, A. M., Smit, A. B. & van den Maagdenberg, A. M. J. M., 2010, In: Journal of Proteomics. 10, 13, p. 2531-2535

**Stimulated Gene Expression Profiles as a Blood Marker of Major Depressive Disorder**

Spijker, S., van Zanten, J. S., de Jong, S., Penninx, B. W. J. H., van Dyck, R., Zitman, F. G., Smit, J. H., Ylstra, B., Smit, A. B. & Hoogendijk, W. J. G., 2010, In: Biological Psychiatry. 68, 2, p. 179-186

**The Netherlands Twin Register Biobank: A resource for genetic epidemiological studies**

Willemsen, G., de Geus, E. J. C., Bartels, M., van Beijsterveldt, C. E. M., Brooks, A. I., Estourgie-van Burk, G. F., Fugman, D. A., Hoekstra, C., Hottenga, J. J., Kluff, C., Meijer, P., Montgomery, G. W., Rizzu, P., Sondervan, D., Smit, A. B., Spijker, S., Suchiman, H. E. D., Tischfield, J. A., Lehner, T., Slagboom, P. E., & 1 othersBoomsma, D. I., 2010, In: Twin Research and Human Genetics. 13, 3, p. 231-245

**Activity and impulsive action are controlled by different genetic and environmental factors**

Loos, M., van der Sluis, S., Bochdanovits, Z., Zutphen, I. J., Pattij, T., Stiedl, O., Smit, A. B. & Spijker, S., 2009, In: Genes, Brain and Behavior. 8, 8, p. 817-828 11 p.

**Long-lasting cognitive deficits resulting from adolescent nicotine exposure in rats**

Counotte, D. S., Spijker, S., van de Burgwal, L. H., Hogenboom, F., Schoffemeer, A. N. M., de Vries, T. J., Smit, A. B. & Pattij, T., 2009, In: Neuropsychopharmacology. 34, 2, p. 299-306 7 p.

**Prefrontal cortex AMPA receptor plasticity is crucial for cue-induced relapse to heroin-seeking**

van den Oever, M. C., Goriounova, N. A., Li, K. W., van der Schors, R. C., Binnekade, R., Schoffemeer, A. N. M., Mansvelder, H. D., Spijker, S., Smit, A. B. & de Vries, T. J., 2008, In: Nature Neuroscience. 11, p. 1053-1058

**Distributed network actions by nicotine increase the threshold for spike-timing-dependent plasticity in prefrontal cortex**  
Couey, J. J., Meredith, R. M., Spijker, S., Poorthuis, R. B., Smit, A. B., Brussaard, A. B. & Mansvelder, H. D., 2007, In: *Neuron*. 54, 1, p. 73-87

**Glucocorticoids specifically enhance L-type calcium current amplitude and affect calcium channel subunit expression in the mouse hippocampus**  
Chameau, P., Qin, Y., Spijker, S., Smit, A. B. & Joels, M., 2007, In: *Journal of Neurophysiology*. 97, p. 5-14 10 p.

**Quantitative proteomics and protein network analysis of hippocampal synapses of CaMKIIalpha mutant mice**  
Li, K. W., Miller, S., Klychnikov, O. I., Loos, M., Stahl-Zeng, J., Spijker, S., Mayford, M. & Smit, A. B., 2007, In: *Journal of Proteome Research*. 6, 8, p. 3127-3133

**A proteomics approach to identify long-term molecular changes in rat medial prefrontal cortex resulting from sucrose self-administration**  
van den Oever, M. C., Spijker, S., Li, K. W., Jimenez, C. R., Koya, E., van der Schors, R. C., Gouwenberg, Y., Binnekade, R., de Vries, T. J., Schoffelmeer, A. N. M. & Smit, A. B., 2006, In: *Journal of Proteome Research*. 5, p. 147-154 8 p.

**Enhanced cortical and accumbal molecular reactivity associated with conditioned heroin, but not sucrose-seeking behaviour**  
Koya, E., Spijker, S., Voorn, P., Binnekade, R., Schmidt, E. D., Schoffelmeer, A. N. M., de Vries, T. J. & Smit, A. B., 2006, In: *Journal of Neurochemistry*. 98, p. 905-915 11 p.

**Peptidomics of a single identified neuron reveals diversity of multiple neuropeptides with convergent actions on cellular excitability**  
Jimenez, C. R., Spijker, S., de Schipper, S., Lodder, J. C., Janse, C. K., Geraerts, W. P. M., van Minnen, J., Syed, N. I., Burlingame, A. L., Smit, A. B. & Li, K. W., 2006, In: *The Journal of Neuroscience*. 26, 2, p. 518-529 12 p.

**Reduced expression of neuropeptide genes in a genome-wide screen of a secretion-deficient mouse**  
Bouwman, J., Spijker, S., Schut, D., Wachtler, B., Ylstra, B., Smit, A. B. & Verhage, M., 2006, In: *Journal of Neurochemistry*. 99, 1, p. 84-96 13 p.

**Mice lacking the major adult GABAA receptor subtype have normal number of synapses, but retain juvenile IPSC kinetics until adulthood.**  
Bosman, L.W., Heinen, K., Spijker, S. & Brussaard, A.B., Jul 2005, In: *Journal of Neurophysiology*.

**Mice lacking the major adult GABA(A) receptor subtype have normal number of synapses, but retain juvenile IPSC kinetics until adulthood**  
Bosman, L. W. J., Heinen, K., Spijker, S. & Brussaard, A. B., 2005, In: *Journal of Neurophysiology*. 94, 1, p. 338-346 9 p.

**Molecular reactivity of mesocorticolimbic brain areas of high and low grooming rats after elevated plus maze exposure**  
Koya, E., Spijker, S., Homberg, J. R., Voorn, P., Schoffelmeer, A. N. M., de Vries, T. J. & Smit, A. B., 2005, In: *Molecular Brain Research*. 137, 1-2, p. 184-192 9 p.

**GABA(A) receptor maturation in relation to eye opening in the rat visual cortex**  
Heinen, T. H. K., Bosman, L. W. J., Spijker, S., van Pelt, J., Smit, A. B., Voorn, P., Baker, R. E. & Brussaard, A. B., 2004, In: *Neuroscience*. 124, p. 161-171 11 p.

**GABAA receptor maturation in relation to eye opening in the rat visual cortex.**  
Heinen, K., Bosman, L.W., Spijker, S., van, P. J., Smit, A.B., Voorn, P., Baker, R.E. & Brussaard, A.B., 2004, In: *Neuroscience*.

**Granularin, a novel molluscan opsonin comprising a single vWF type C domain is up-regulated during parasitization**  
Smit, A. B., de Jong-Brink, M., Li, K. W., Sassen, M. J. M., Spijker, S., van Elk, R., Buijs, S. P., van Minnen, J. & van Kesteren, R. E., 2004, In: *FASEB Journal*. 18, p. 845-847

**Morphine exposure and abstinence define specific stages of gene expression in the rat nucleus accumbens**

Spijker, S., Houtzager, S. W. J., de Gunst, M. C. M., de Boer, W. P. H., Schoffelmeer, A. N. M. & Smit, A. B., 2004, In: FASEB Journal. 18, p. 848-850

**Profiling gene expression in whole blood samples following an in-vitro challenge**

Spijker, S., van de Leemput, J. C. H., Hoekstra, C., Boomsma, D. I. & Smit, A. B., 2004, In: Twin Research. 7, 6, p. 564-570

**Stimulus-dependent regulation and cellular expression of genes encoding neuropeptides, prohormone convertases, alpha-amidating enzyme and 7B2 in identified Lymnaea neurons**

Spijker, S., Sharp-Baker, H. E., Geraerts, W. P. M., van Minnen, J. & Smit, A. B., 2004, In: Journal of Neurochemistry. 90, p. 287-296 10 p.

**Evidence for enhanced neurobehavioral vulnerability to nicotine during periadolescence in rats**

Adriani, W., Spijker, S., Deroche-Gamonet, V., Laviola, G., Le Moal, M., Smit, A. B. & Piazza, P. V., 2003, In: The Journal of Neuroscience. 23, 11, p. 4712-4716 5 p.

**Impaired dendritic spine maturation in GABA(A) receptor alpha 1 subunit knock out mice**

Heinen, T. H. K., Baker, R. E., Spijker, S., Rosahl, T., van Pelt, J. & Brussaard, A. B., 2003, In: Neuroscience. 122, 3, p. 699-705 7 p.

**Impaired dendritic spine maturation in GABAA receptor alpha1 subunit knock out mice.**

Heinen, K., Baker, RE., Spijker, S., Rosahl, T., van, P. J. & Brussaard, AB., 2003, In: Neuroscience.

**Transient downregulation of Sema3A mRNA in a rat model for temporal lobe epilepsy - A novel molecular event potentially contributing to mossy fiber sprouting**

Holtmaat, A. J. G. D., Gorter, J. A., de Wit, J., Tolner, E. A., Spijker, S., Giger, R. J., Lopes da Silva, F. H. & Verhaagen, J., 2003, In: Experimental Neurology. 182, 1, p. 142-150 9 p.

**Active heroin administration induces specific genomic responses in the nucleus accumbens shell**

Jacobs, E. H., Spijker, S., Verhoog, C. W., Kamprath, K., de Vries, T. J., Smit, A. B. & Schoffelmeer, A. N. M., 2002, In: FASEB Journal. 16, 12, p. U40-U56 17 p.

**Neuropeptide amidation: cloning of a bifunctional alpha-amidating enzyme from Aplysia**

Fan, X. M., Spijker, S., Akalal, D. B. G. & Nagle, G. T., 2000, In: Molecular Brain Research. 82, 1-2, p. 25-34 10 p.

**Self-administration of heroin induces the expression of a different subset of genes than forced administration in rat nucleus accumbens shell after long-term extinction**

Jacobs, E. H., Smit, A. B., Houtzager, S. W. J., de Vries, T. J., Spijker, S., Wishaupt, R. G. A., Kamprath, K., Verhoog, C. W., Binnekade, R. & Schoffelmeer, A. N. M., 2000, In: European Journal of Neuroscience. 12, p. 206-206 1 p.

**A molluscan peptide alpha-amidating enzyme precursor that generates five distinct enzymes**

Spijker, S., Smit, A. B., Eipper, B. A., Malik, A., Mains, R. E. & Geraerts, W. P. M., 1999, In: FASEB Journal. 13, 6, p. 735-748 14 p.

**Family of prohormone convertases in Lymnaea: Characterization of two alternatively spliced furin-like transcripts and cell-specific regulation of their expression**

Spijker, S., Smit, A. B., Sharp-Baker, H. E., van Elk, R., van Kesteren, E. R., van Minnen, J., Kurosky, A. & Geraerts, W. P. M., 1999, In: Journal of Neurobiology. 41, 3, p. 399-413 15 p.

**Towards understanding the role of insulin in the brain: Lessons from insulin-related signaling systems in the invertebrate brain**

Smit, A. B., van Kesteren, R. E., Li, K. W., van Heerikhuizen, H., van Minnen, J., Spijker, S. & Geraerts, W. P. M., Jan 1998, In: Progress in Neurobiology. 54, 1, p. 35-54 20 p.



**Direct mass spectrometric peptide profiling and sequencing of single neurons reveals differential peptide patterns in a small neuronal network**

Jimenez, C. R., Li, K. W., Dreisewerd, K., Spijker, S., Kingston, R., Bateman, R. H., Burlingame, A. L., Smit, A. B., van Minnen, J. & Geraerts, W. P. M., 1998, In: *Biochemistry*. 37, p. 2070-2076 7 p.

**Molecular dissection of the neuronal regulated secretory pathway of the mollusc *Lymnaea stagnalis***

Spijker, S., 1998, Amsterdam. 131 p.

**Identification of a molluscan homologue of the neuroendocrine polypeptide 7B2.**

Spijker, S., Smit, AB., Martens, GJ. & Geraerts, WP., Feb 1997, In: *Journal of Biological Chemistry*.

**Cell type-specific sorting of neuropeptides: a mechanism to modulate peptide composition of large dense-core vesicles.**

Klumperman, J., Spijker, S., van, M. J., Sharp-Baker, H., Smit, AB. & Geraerts, WP., Dec 1996, In: *The Journal of neuroscience : the official journal of the Society for Neuroscience*.

**Expression and characterization of molluscan insulin-related peptide VII from the mollusc *Lymnaea stagnalis*.**

Smit, AB., Spijker, S., Van, M. J., Burke, JF., De, W. F., Van, E. R. & Geraerts, WP., Jan 1996, In: *Neuroscience*.

**Molecular cloning and cellular localization of a furin-like prohormone convertase from the atrial gland of *Aplysia*.**

Nagle, GT., Garcia, AT., Gorham, EL., Knock, SL., van, H. WR., Spijker, S., Smit, AB., Geraerts, WP. & Kurosky, A., May 1995, In: *DNA and Cell Biology*.

**Structural characterization of a *Lymnaea* putative endoprotease related to human furin.**

Smit, AB., Spijker, S., Nagle, GT., Knock, SL., Kurosky, A. & Geraerts, WP., Apr 1994, In: *FEBS Letters*.

**Molluscan putative prohormone convertases: structural diversity in the central nervous system of *Lymnaea stagnalis*.**

Smit, AB., Spijker, S. & Geraerts, WP., Nov 1992, In: *FEBS Letters*.

## Projects

### Employment

**Full Professor**

Molecular and Cellular Neurobiology

Vrije Universiteit Amsterdam

1 Mar 2012 → present

**Full Professor**

Amsterdam Neuroscience - Cellular & Molecular Mechanisms

Vrije Universiteit Amsterdam

1 Jan 2016 → present

**Full Professor**

Amsterdam Neuroscience - Compulsivity, Impulsivity & Attention

Vrije Universiteit Amsterdam

1 Jan 2016 → present

**Full Professor**

Amsterdam Neuroscience - Mood, Anxiety, Psychosis, Stress & Sleep

Vrije Universiteit Amsterdam

1 Jan 2016 → present