

## ***CURRICULUM VITAE***

Name: Roger Antonius Henricus Adan  
Born: 16 July 1961, Roosendaal, NL  
Address: Brain Center Rudolf Magnus, University Medical Center, Utrecht, Department of Translational Neuroscience, Universiteitsweg 100, 3584 CG Utrecht, NL  
Telephone: +31 8875 68517; fax: +31 8875 69032;  
e-mail: [r.a.h.adan@umcutrecht.nl](mailto:r.a.h.adan@umcutrecht.nl)

***In short:*** I was trained as a molecular neurobiologist and received my PhD in 1992 investigating the regulation of vasopressin and oxytocin gene expression. Since 2002 I have held the position of Professor in Molecular Pharmacology. Via working on melanocortin receptors, I became an expert in molecular and neural pathways underlying feeding behavior, obesity and eating disorders. My research group has a strong multidisciplinary character. A variety of strategies (chemogenetics, viral vector technology, in vivo electrophysiology, optogenetics and automated behavioral and physiological analysis) are used to unravel the mechanisms underlying behavior. The main focus of the group is on feeding, since this is a natural behavior ideally suited to dissect neural circuits that underlie decision-making, anxiety, anhedonia, impulsivity and reward seeking.

In addition to my work at UMCU, I am a scientific advisor at Rintveld Eating disorder clinic, Altrecht, Zeist and a guest professor at Sahlgrenska Academy, University of Gothenburg, Sweden.

### ***Education***

- 1984-1988: Medical Biology, Utrecht University (examination August 1988)  
Undergraduate training:  
a) Supervisor: Dr. A. Durston, Hubrecht Laboratory, Utrecht, Topic: "The involvement of cAMP in gastrulation and neural induction in *Xenopus*"  
b) Supervisor: Dr. E.R. de Kloet, Rudolf Magnus Institute, Utrecht, Topic: "Corticosteroid binding sites and function on lymphocytes".
- 1988-1992: PhD student. Supervisors: Prof.dr. J.P.H. Burbach and Prof.dr. W.H. Gispen, Rudolf Magnus Institute, Faculty of Medicine, Utrecht University, NL.  
Title of thesis "Oxytocin and vasopressin genes: transcriptional regulation and signal transduction" (June 1992).
- 2000 Niaba Masterclass Biobusiness, Management Center "De Baak", Noordwijk.

### ***Scientific career***

- 1990: Visiting scientist at the Institute of Molecular and Cell Biology, working in the transgenic group of Dr. David Murphy, Singapore.

Project: "The generation and analysis of transgenic mice having a luciferase-transgene driven by the oxytocin promoter".

- 1992-1994: Post-doc at the Department of Medical Pharmacology, Rudolf Magnus Institute for Neurosciences, Utrecht University, NL  
Research topic: "Molecular biology of neuropeptide receptors".
- 1994-1998: Assistant Professor at the Department of Medical Pharmacology, Rudolf Magnus Institute for Neurosciences, Utrecht University, NL
- 1998-2002 Associate Professor at the Department of Department of Pharmacology and Anatomy, Rudolf Magnus Institute for Neurosciences, Utrecht University, NL
- 2002- Professor in Molecular Pharmacology, Department Translational Neuroscience, Brain Center Rudolf Magnus, University Medical Center, Utrecht, NL
- 2010- Scientific advisor at Rintveld Eating disorder clinic (Zeist, NL) and member of the scientific Board of Alrecht Science (Utrecht, NL)
- 2017- Guest professor Sahlgrenska Academy, University of Gothenburg, Sweden

## ***Teaching***

Since 1990 I have been involved in teaching of the Department of Translational Neuroscience (<http://translationalneuroscience.nl/>). As professor in Molecular Pharmacology I have a shared responsibility for the pharmacology teaching to medical students of UMCU. In this role I have developed a teaching program that mostly focuses on pharmacodynamics. I also assisted in development of the Master Neuroscience and Cognition (<http://www.neuroscience-cognition.org/>). My lectures to Medical, Pharmacy and Science student cover a wide range of topics in (molecular) pharmacology, neuroscience and endocrinology. In addition, my group provides approximately 10 internships for undergrad students per year and assists approximately 10 students a year in theses writing. My lab had on average 7 PhD students over the last 10 years.

### ***Yearly courses taught and/or administered***

#### **Head of Course**

- \*Precision Medicine (3<sup>rd</sup> year medical students) –
- \*Bioinformatics in Neuroscience (Master student course)

#### **Regular teaching activities**

- Healthy and diseased cells (1<sup>st</sup> year medical students) - pharmacology
- \*Regulation and Integration (1<sup>st</sup> year medical students) - pharmacodynamics
- \*Essential neuroscience (2<sup>nd</sup> year Bachelor course biomedical students) – neural circuits of energy balance
- \*Advanced neuroscience (3<sup>rd</sup> year Bachelor course biomedical students) – neural mechanisms in obesity and eating disorders
- Feeding (3<sup>rd</sup> year medical students) – neural mechanisms underlying feeding behavior

- Metabolic disorders (Master student course) - neural circuits and models of obesity
- \*Neuroscience and Cognition (Master student course) – novel technologies to address CNS function

### **Examination duties**

Each year examination of internships of 6-10 Master Student

Each year examination of the thesis of 4-8 Bachelor Students

### **Research administration**

Department officer for research involving animals

Department officer for research concerning genetically modified organisms

Each year 5-10 times member of PhD examination committees, 3-4 times a year chairman of PhD committee

Member of the scientific board of Altrecht Science, the targets mental hospital in the Utrecht area

### **Administration through international societies and bodies**

- ECNP workshop committee

- ECNP nutrition network (Co-founder) - regular meetings and agenda to put "nutrition and brain health" on the EC agenda for future funding. Secondly, to enhance cooperation between the Food industry and neuroscientists working with diseases linked to eating disorders and psychiatry more generally.

- Member of the board of SSIB (Society of the study of ingestive behaviour)

- Raising EC funding, operating as shadow coordinator on the funded projects NeuroFAST and NudgeIT, with a key role is assembling the consortium and deciding on the scientific strategy and leadership of the project.

- Scientific advisor at EFSA (European Food Safety Authority)

### ***Indications of esteem:***

#### ***Grants***

- AIO (RUU; 1994-1998): "The role of melanocortin receptors in nerve regeneration"; 300 kEuros

- OIO (NWO 903-42-009' 1995-1999): "Design of selective neural melanocortin receptor (ant)agonist" ; 300 kEuros

- Post-doc + technician (Licentec/SCI-2; 1995-1997): "Development of MC receptor (ant)agonists's" ; 600 kEuros

- Post-doc (David de Wied Fellow; 1995): "Melanocortin receptor mediated grooming behavior in the rat" ; 200 kEuros

- Post-doc+ OIO + 2 technicians (NWO/NDRF-940-70-001; 1998-2002): "Towards rational drug design: from melanocortin receptor to (ant)agonist" 700 kEuros

- Project leader of the NWO/NDRF program (1998-2002; sponsored by a pharmaceutical company and NWO) at Utrecht University, at which 6 PhD students/Post-Docs have been appointed at three different locations ; 1300 kEuros

- Post-doc (NWO-program grant 903-39-193; 1998-2000): “Involvement of brain melanocortins in body weight homeostasis”; 300 kEuros
- OIO (NWO project grant 903-39-175; 2000-2005): “Involvement of the melanocortin system in activity-induced anorexia”; 300 kEuros
- AGIKO (UMC-U; 2001-2005): “The melanocortin system and neuropathic pain”; 200 kEuros
- STIGO project (nr 014-80-105; 2002-2005) “GPCR pharmacophore discovery” ; 200 kEuros
- NWO-VIDI grant (016.036.322; 2002-2007): Role of neuropeptides in disorders of energy balance; 670 kEuros
- STW valorization grant UFA.7249 (2003-2005) Drug target validation in knock-down rats; 100 kEuros
- Horizon Doorbraakproject (050-71-003; 2005-2007) shRNA receptor knock-down in transgenic rats as tool to validate drug targets for obesity; 200 kEuros
- NWO-VEMI grant (945-05-017; 2005-2008): The mandometer method versus conventional treatment; 250 kEuros
- Diabetes pilot grant (2005.11.004; 2007-2010): Central leptin signaling and the development of insulin resistance (coapplicant with with SE la Fleur); 300 kEuros
- PI of TI pharma grant T5-210 (2008-2012) Rapid in vivo CNS drug target validation and therapeutic potential by RNA-interference'; 700 kEuros
- TI pharma project T2-105 (2008-2012) Investigation of drug induced weight alterations to identify novel therapeutic strategies for the treatment of obesity, dyslipidemia and diabetes; 750 kEuros
- TI pharma project D1-105 (2008-2012) The GPCR Forum. Novel concepts and tools for established targets; 600 kEuros
- EU grant Marie Curie training network (2009-2012): INTACT; 270 kEuros
- FP7 framework program Neurofast ( FP7-KBBE-2009-3-245009; 2010-2015); 650 kEuros
- FP7 framework program Full4Health (FP7-KBBE-2010-4-266408; 2011-2016); 700 kEuros
- NeuroBasic project (2012-2016); 400 kEuros
- FP7 framework program I-Family (FP7-KBBE-2010-4266044; 2012-2017); 600 kEuros
- STW project Nutrients to modulate obesity-associated brain inflammation (grant 12264;2013-2017); 400 kEuros
- FP7 framework program Nudge-IT (KBBE.2013.2.2-01; 2014-2018); 950 kEuros
- ZonMW Top grant: shining light on loss of control (2015-2019); 650 kEuros

### ***Current Grants***

- ALW grant: Unraveling the neural circuits that drive food choices (2016-2020); 350 kEuro

- Swedish Research Council (2018-02588): 300kEuro
- ERANET grant MiGBAN (2019-2022) 250kEuros
- Stichting Vogelgezag: 100kEuros (2019-2020)

### ***Prizes***

- Recipient of the Hoebel Prize for Creativity 2016, from the Society for the Study of Ingestive Behaviour. This is an International Prize that honors an exceptional level of creativity and excellence research on ingestive behavior.
- Recipient of the Organon prize for pharmacology 2004
- Recipient of the Rudolf Magnus Research Prize 2003

### ***Invited lectures***

- Roger Adan is a regular invited speaker at international symposia. Some of the recent conferences where he was an invited speaker include:
- Mediterranean Neuroscience meeting 2015 Sardinia
- Cold Spring Harbour meeting on Chemogenetics 2015
- European Congress on Obesity 2016 Gothenburg
- SSIB meeting 2016 Porto
- British Neuroendocrine Society meeting 2016 Glasgow
- European College of NeuroPsychoPharmacology (ECNP) meeting 2016 Vienna
- Werner Reichardt Centre for Integrative Neuroscience (CIN) symposium 2016 Tübingen
- Invited lecture during annual institutes day of Institute of Neuroscience and Physiology, The Sahlgrenska Academy at the University of Gothenburg, Sweden, 2017
- European College of NeuroPsychoPharmacology (ECNP) meeting 2017 Paris
- Neurobiology of Obesity Symposium, Rowett Institute, 2017 Aberdeen

### ***Editorial and Organisational activities***

- Member of the scientific advisory panel of EFSA (European Food Safety Authority) of the workgroup “Added sugars” (since 2017)
- CoChair of the Nutrition Network of ECNP (since 2017)
- Member of the Workshop for young scientists committee of ECNP (since 2017)
- Member of the Scientific Board of the Society for the Study of Ingestive behavior (2016-2019)
- Member of the Editorial Boards of the journal, Physiology Reports (since 2012) and Journal of Neuroscience and Cognitive Studies (since 2017)

- Editor of the book Behavioral Neurobiology of Eating Disorders (2010)
- Author of the chapter “Effects of melanocortins in the nervous system” in “The Melanocortin receptors”, edited by Dr. R.D. Cone by Humana Press in their receptor series (2005)
- Chairman (together with Professor Vriend (KUN)) of the Platform of Research on GPCRs in The Netherlands: twice a year organization of a symposium on G protein coupled receptors (until 2002).
- Assistant-editor European Journal of Pharmacology of the special issues Pharmacogenomics Pharmacotherapy of Obesity (2000-2001)
- Author of the chapter “Eating disorders and obesity” in Psychopharmacogenetics, edited by Philip Gorwood and Michel Hamon, Kluwer Academic/Plenum Publishing (2005).
- Member of the FIGON Council (2002-2011)
- Member of the organizing committee of the Dutch endo-neuro-psycho meeting (from 2004-2008; chairman in 2007)
- Member of the international symposium on 100 years pharmacology in the Netherlands in 2008.
- Member of the local organizing committee of the FENS in Amsterdam 2010.
- Member of the Commissie Toetsing en Beoordeling (CTB) of the Dutch pharmacological society (since 2006)
- Co-organizer of the Summer schools of the Rudolf Magnus Institute for Neurosciences (2001-2003)

## ***PhD theses supervision***

### ***(co-promotor/co-supervisor)***

Melanocortin receptors: relating expression to function  
 Utrecht, 21 April 1998  
 Manou van der Kraan

The molecular pharmacology of melanocortin MC3 and MC4 receptors  
 Utrecht, 11 January 2000.  
 Julia Oosterom

### ***(promotor/main supervisor)***

Melanocortins and neuropathic pain  
 Utrecht, 12 March 2003  
 Dorien Vrinten

On the molecular pharmacology of melanocortin-4 receptor  
 Utrecht, 12 March 2003  
 Wouter Nijenhuis

Hypothalamic signaling in an animals model of anorexia  
Utrecht, 14 January 2005  
Jacqueline Hillebrand

Molecular studies on the melanocortin system in relation to anorexia  
Utrecht, 7 June 2005  
Corine de Rijke

Understanding obesity by local overexpression of neuropeptides: a viral vector based approach  
Utrecht, 29 march 2007  
Gitte Tiesjema

Neural circuits underlying hyperactivity in an animal model for anorexia nervosa  
Utrecht, 2 June 2009  
Linda Verhagen

Optimization of viral vector technology to study gene function in the hypothalamus  
Utrecht, 3 June 2010  
Marijke de Backer

Developmental programming of energy balance  
Amsterdam, 3 December 2010  
Floor Remmers

Olanzapine-induced weight gain  
Utrecht, 30 June 2011  
Esther van der Zwaal

Getting ready for dinner, the role of ghrelin in food anticipatory behavior  
Utrecht, 29 May 2012  
Myrte Merkestein

Translational neuroscience of anorexia nervosa  
Utrechts 25 September 2012  
Eneda Pjetri

Constitutive cannabinoid and opioid receptor activity in the VTA  
Utrecht, 26 September 2012  
Frank Meje

Towards the neurobiology of compulsive rituals  
Utrecht, 27 September 2012  
Ria de Haas

Functional characterization of obesogenic neural circuitries  
Utrecht, 22 January 2015

Arjen Boender

Validation of RNA interference as technique to study CNS anti-obesity drug targets

Utrecht, 30 April 2015

Margriet van Gestel

Eating addiction? The nerves and fibers that control food intake

Utrecht, 30 June 2015

Johannes de Jong

Of dieting and leptin

Utrecht, 23 September 2015

Rahul Pandit

Anorexia nervosa: From single SNP studies, through biomarkers, to genome-wide association

Utrecht, 19 January 2016

Marek Brandys

Dopamine neuronal activity and food seeking

Utrecht, 8 June 2016

Ruud van Zessen

Behavioural effects of chemogenetic dopamine neuron activation

Utrecht, 20 december 2016

Linde Boekhoudt

Challenging the concepts related to leptin, the hypothalamus and energy balance

Utrecht, 30 October 2018

Kathy de Git

Neuroeconomic mechanisms of reward and aversion

Utrecht, 8 January 2019

Jeroen Verharen

Roles of leptin receptor-expressing neurons in body weight regulation

Utrecht, 16 April 2019

Veronne de Vrind

Characterization and manipulation of feeding-related neural circuits

Utrecht, 7 November 2019

Tessa Goes-Roelofs

## ***Collaborations***

### ***National:***



Brainscapes with VU and LUMC

NeuroBasic with neuroscientists from ErasmusMC, VU (CNCR), NIN and others

Dr. S.E.la Fleur, Endocrinology, AMC, Amsterdam

Dr P.A.M. Smeets, UMCU, Utrecht

Prof. L. Vanderschuren, faculty of veterinary medicine, Utrecht

Prof R. Dijkhuizen, Image Science institute, Utrecht

Prof C. de Graaf, Wageningen University

Prof dr W.H. Hoek en Prof A.A. van Elburg, Kliniek eetstoornissen, Rintveld, Altrecht, Zeist.

***International:***

Profs S. L. Dickson and J.O. Jansson, Department of Physiology/Endocrine, Institute of Neuroscience and Physiology, The Sahlgrenska Academy at the University of Gothenburg, Sweden

Prof U. Schmidt, The Institute of Psychiatry, King's College London

Prof G. Leng, Center for Integrative Physiology, Edinburgh, UK

Dr. G. Stuber, Department of Psychiatry, University of North Carolina at Chapel Hill, USA

Prof. dr. med. Johannes Hebebrand, Department of Child and Adolescent Psychiatry University Duisburg-Essen, Germany

Prof. dr. Z. Liposits, Institute of Experimental Medicine Hungarian Academy of Sciences, Budapest Hungary

Prof. dr C. Diéguez, Faculty of Medicine, University of Santiago de Compostela, Spain

## ***Publications***

(Google scholar Citations: 9993; h-index:55; i10-index:177)

Nutritional psychiatry: Towards improving mental health by what you eat. **Adan RAH**, van der Beek EM, Buitelaar JK, Cryan JF, Hebebrand J, Higgs S, Schellekens H, Dickson SL. *Eur Neuropsychopharmacol.* 2019 Nov 14. pii: S0924-977X(19)31723-7

Hypothalamic dopamine signaling regulates brown fat thermogenesis. Folgueira C, Beiroa D, Porteiro B, Duquenne M, Puighermanal E, Fondevila MF, Barja-Fernández S, Gallego R, Hernández-Bautista R, Castela C, Senra A, Seoane P, Gómez N, Aguiar P, Guallar D, Fidalgo M, Romero-Pico A, **Adan R**, Blouet C, Labandeira-García JL, Jeanrenaud F, Kallo I, Liposits Z, Salvador J, Prevot V, Dieguez C, Lopez M, Valjent E, Frühbeck G, Seoane LM, Nogueiras R. *Nat Metab.* 2019 Aug;1(8):811-829

Assessing causal links between metabolic traits, inflammation and schizophrenia: a univariable and multivariable, bidirectional Mendelian-randomization study. Lin BD, Alkema A, Peters T, Zinkstok J, Libuda L, Hebebrand J, Antel J, Hinney A, Cahn W, **Adan R**, Luyckx JJ. *Int J Epidemiol.* 2019 Oct 1;48(5):1505-1514

Rats that are predisposed to excessive obesity show reduced (leptin-induced) thermoregulation even in the preobese state. de Wit KCG, den Outer JA, Wolterink-Donselaar IG, Lujendijk MCM, Schéle E, Dickson SL, **Adan RAH**. *Physiol Rep.* 2019 Jul;7(14):e14102

Development and body mass inversely affect children's brain activation in dorsolateral prefrontal cortex during food choice. van Meer F, van der Laan LN, Eiben G, Lissner L, Wolters M, Rach S, Herrmann M, Erhard P, Molnar D, Orsi G, Viergever MA, **Adan RAH**, Smeets PAM; I.Family Consortium. *Neuroimage.* 2019 Nov 1;201:116016

Genome-wide association study identifies eight risk loci and implicates metabo-psychiatric origins for anorexia nervosa. Watson HJ, Yilmaz Z, Thornton LM, Hübel C, Coleman JRI, Gaspar HA, Bryois J, Hinney A, Leppä VM, Mattheisen M, Medland SE, Ripke S, Yao S, Giusti-Rodríguez P; Anorexia Nervosa Genetics Initiative, Hanscombe KB, Purves KL; Eating Disorders Working Group of the Psychiatric Genomics Consortium, **Adan RAH**, ...Sullivan PF, Breen G, Bulik CM. *Nat Genet.* 2019 Aug;51(8):1207-1214.

Emotion-driven impulsiveness but not decision-making ability and cognitive inflexibility predicts weight status in adults. Coumans MJM, Danner UN, Hadjigeorgiou C, Hebestreit A, Hunsberger M, Intemann T, Lauria F, Michels N, Kurdiné EM, Moreno LA, Reisch LA, Thumann BF, Veidebaum T, **Adan RAH**; I.Family consortium. *Appetite.* 2019 Nov 1;142:104367

Associations Between Attention-Deficit/Hyperactivity Disorder and Various Eating Disorders: A Swedish Nationwide Population Study Using Multiple Genetically Informative Approaches. Yao S, Kuja-Halkola R, Martin J, Lu Y, Lichtenstein P, Noring C, Birgegård A, Yilmaz Z, Hübel C, Watson H, Baker J, Almqvist C; **Eating Disorders Working Group of the Psychiatric**

**Genomics Consortium**, Thornton LM, Magnusson PK, Bulik CM, Larsson H. *Biol Psychiatry*. 2019 Oct 15;86(8):577-586

Verharen JPH, Danner UN, Schröder S, Aarts E, van Elburg AA, **Adan RAH**. Insensitivity to Losses: A Core Feature in Patients With Anorexia Nervosa? *Biol Psychiatry Cogn Neurosci Neuroimaging*. 2019 Nov;4(11):995-1003. doi: 10.1016/j.bpsc.2019.05.001. Epub 2019 May 13

Verharen JPH, **Adan RAH**, Vanderschuren LJMJ. Differential contributions of striatal dopamine D1 and D2 receptors to component processes of value-based decision making. *Neuropsychopharmacology*. 2019 Dec;44(13):2195-2204

de Vrind VAJ, Rozeboom A, Wolterink-Donselaar IG, Luijendijk-Berg MCM, **Adan RAH**. Effects of GABA and Leptin Receptor-Expressing Neurons in the Lateral Hypothalamus on Feeding, Locomotion, and Thermogenesis. *Obesity (Silver Spring)*. 2019 Jul;27(7):1123-1132

Verharen JPH, van den Heuvel M, Luijendijk M, Vanderschuren LJMJ, **Adan RAH**. Corticolimbic mechanisms of behavioral inhibition under threat of punishment. *J Neurosci*. 2019 Mar 22. pii: 2814-18

Kakava-Georgiadou N, Zwartkruis MM, Bullich-Vilarrubias C, Luijendijk MCM, Garner KM, van der Plasse G, **Adan RAH**. An Intersectional Approach to Target Neural Circuits With Cell- and Projection-Type Specificity: Validation in the Mesolimbic Dopamine System. *Front Mol Neurosci*. 2019 Feb 28;12:49

Verharen JPH, **Adan RAH**, Vanderschuren LJMJ. How Reward and Aversion Shape Motivation and Decision Making: A Computational Account Neuroscientist. 2019 Mar 13:1073858419834517

Verharen JPH, Roelofs TJM, Menting-Henry S, Luijendijk MCM, Vanderschuren LJMJ, **Adan RAH**. Limbic control over the homeostatic need for sodium. *Sci Rep*. 2019 Jan 31;9(1):1050

Peris-Sampedro F, Mounib M, Schéle E, Edvardsson CE, Stoltenborg I, **Adan RAH**, Dickson SL. Impact of Free-Choice Diets High in Fat and Different Sugars on Metabolic Outcome and Anxiety-Like Behavior in Rats. *Obesity (Silver Spring)*. 2019 Mar;27(3):409-419

Verharen JPH, Kentrop J, Vanderschuren LJMJ, **Adan RAH**. Reinforcement learning across the rat estrous cycle. *Psychoneuroendocrinology*. 2018 Sep 24;100:27-31

van Iersel L, Brokke KE, **Adan RAH**, Bulthuis LCM, van den Akker ELT, van Santen HM. Pathophysiology and Individualized Treatment for Hypothalamic Obesity Following Craniopharyngioma and Other Suprasellar Tumors: A Systematic Review. *Endocr Rev*. 2018 Sep 20. doi: 10.1210/er.2018-00017

de Git KCG, van Tuijl DC, Luijendijk MCM, Wolterink-Donselaar IG, Ghanem A, Conzelmann KK, **Adan RAH**. Anatomical projections of the dorsomedial hypothalamus to the periaqueductal grey and their role in thermoregulation: a cautionary note. *Physiol Rep*. 2018 Jul;6(14):e13807

Langhans W, **Adan R**, Arnold M, Banks WA, Card JP, Dailey MJ, Daniels D, de Kloet AD, de Lartigue G, Dickson S, Fedele S, Grill HJ, Jansson JO, Kaufman S, Kolar G, Krause E, Lee SJ, Le Foll C, Levin BE, Lutz TA, Mansouri A, Moran TH, Pacheco-López G, Ramachandran D, Raybould H, Rinaman L, Samson WK, Sanchez-Watts G, Seeley RJ, Skibicka KP, Small D, Spector AC, Tamashiro KL, Templeton B, Trapp S, Tso P, Watts AG, Weissfeld N, Williams D, Wolfrum C, Yosten G, Woods SC. New horizons for future research - Critical issues to consider for maximizing research excellence and impact. *Mol Metab.* 2018 May 12. pii

de Git KCG, Peterse C, Beerens S, Luijendijk MCM, van der Plasse G, la Fleur SE, **Adan RAH**. Is leptin resistance the cause or the consequence of diet-induced obesity? *Int J Obes (Lond)*. 2018 Aug;42(8):1445-1457

Hebebrand J, Peters T, Schijven D, Hebebrand M, Grasemann C, Winkler TW, Heid IM, Antel J, Föcker M, Tegeler L, Brauner L, **Adan RAH**, Luyckx JJ, Correll CU, König IR, Hinney A, Libuda L. The role of genetic variation of human metabolism for BMI, mental traits and mental disorders. *Mol Metab.* 2018 Jun;12:1-11.

Verharen JP, de Jong JW, Roelofs TJ, Huffels CF, Van Zessen R, Luijendijk MJ, Willuhn I, Hamelink R, den Ouden HE, van der Plasse G, Vanderschuren LJ\*, **Adan RA\***. A neuronal mechanism underlying decision-making deficits during hyperdopaminergic states *Nat Commun.* 2018 Feb 21;9(1):731(\* shared senior author)

Mulders RJ, de Git KCG, Schéle E, Dickson SL, Sanz Y, **Adan RAH**. Microbiota in obesity: interactions with enteroendocrine, immune and central nervous systems. *Obes Rev.* 2018 Apr;19(4):435-451

Coumans MJM, Danner UN, Intemann T, De Decker A, Hadjigeorgiou C, Hunsberger M, Moreno LA, Russo P, Stomfai S, Veidebaum T, **Adan RAH**, Hebestreit A; I.Family Consortium. Emotion-driven impulsiveness and snack food consumption of European adolescents: Results from the I.Family study. *Appetite.* 2018 Apr 1;123:152-159

Romero-Picó A, Sanchez-Rebordelo E, Imbernon M, González-Touceda D, Folgueira C, Senra A, Fernø J, Blouet C, Cabrera R, van Gestel M, **Adan RA**, López M, Maldonado R, Nogueiras R, Diéguez C. Melanin-Concentrating Hormone acts through hypothalamic kappa opioid system and p70S6K to stimulate acute food intake. *Neuropharmacology.* 2017 Dec 1;130:62-70

Huckins LM, Hatzikotoulas K, Southam L, Thornton LM, Steinberg J, Aguilera-McKay F, Treasure J, Schmidt U, Gunasinghe C, Romero A, Curtis C, Rhodes D, Moens J, Kalsi G, Dempster D, Leung R, Keohane A, Burghardt R, Ehrlich S, Hebebrand J, Hinney A, Ludolph A, Walton E, Deloukas P, Hofman A, Palotie A, Palta P, van Rooij FJA, Stirrups K, **Adan R**, Boni C, Cone R, Dedoussis G, van Furth E, Gonidakis F, Gorwood P, Hudson J, Kaprio J, Kas M, Keski-Rahonen A, Kiezebrink K, Knudsen GP, Slof-Op 't Landt MCT, Maj M, Monteleone AM, Monteleone P, Raevuori AH, Reichborn-Kjennerud T, Tozzi F, Tsitsika A, van Elburg A; Eating Disorder Working Group of the Psychiatric Genomics Consortium, Collier DA, Sullivan PF,

Breen G, Bulik CM, Zeggini E. Investigation of common, low-frequency and rare genome-wide variation in anorexia nervosa. *Mol Psychiatry*. 2017 Jul 25. doi: 10

Boekhoudt L, Wijbrans EC, Man JHK, Luijendijk MCM, de Jong JW, van der Plasse G, Vanderschuren LJM, **Adan RAH**. Enhancing excitability of dopamine neurons promotes motivational behaviour through increased action initiation. *Eur Neuropsychopharmacol*. 2018 Jan;28(1):171-184.

Coumans MJM, Danner UN, Ahrens W, Hebestreit A, Intemann T, Kourides YA, Lissner L, Michels N, Moreno LA, Russo P, Stomfai S, Veidebaum T, **Adan RAH**. The association of emotion-driven impulsiveness, cognitive inflexibility and decision-making with weight status in European adolescents. *Int J Obes (Lond)*. 2018 Apr;42(4):655-661.

van Meer F, van der Laan LN, Viergever MA, **Adan RAH**, Smeets PAM; I.Family Consortium. Considering healthiness promotes healthier choices but modulates medial prefrontal cortex differently in children compared with adults. *Neuroimage*. 2017 Aug 4;159:325-333.

Li D, Chang X, Connolly JJ, Tian L, Liu Y, Bhoj EJ, Robinson N, Abrams D, Li YR, Bradfield JP, Kim CE, Li J, Wang F, Snyder J, Lemma M, Hou C, Wei Z, Guo Y, Qiu H, Mentch FD, Thomas KA, Chiavacci RM, Cone R, Li B, Sleiman PA, Hakonarson H; Eating Disorders **Working Group of the Psychiatric Genomics Consortium**; Price Foundation Collaborative Group. A genome-wide association study of anorexia nervosa suggests a risk locus implicated in dysregulated leptin signaling. *Sci Rep*. 2017 Jun 19;7(1):3847

Roelofs TJM, Verharen JPH, van Tilborg GAF, Boekhoudt L, van der Toorn A, de Jong JW, Luijendijk MCM, Otte WM, Dijkhuizen RM\*, **Adan RAH\***. A novel approach to map induced activation of neuronal networks using chemogenetics and functional neuroimaging in rats: A proof-of-concept study on the mesocorticolimbic system. *Neuroimage*. 2017 May 11;156:109-118 (\* shared senior author)

Duncan L, Yilmaz Z, Gaspar H, Walters R, Goldstein J, Anttila V, Bulik-Sullivan B, Ripke S; **Eating Disorders Working Group of the Psychiatric Genomics Consortium**, Thornton L, Hinney A, Daly M, Sullivan PF, Zeggini E, Breen G, Bulik CM. Significant Locus and Metabolic Genetic Correlations Revealed in Genome-Wide Association Study of Anorexia Nervosa. *Am J Psychiatry*. 2017 Sep 1;174(9):850-858.

Vogel H, Kraemer M, Rabasa C, Askevik K, **Adan RAH**, Dickson SL. Genetic predisposition to obesity affects behavioural traits including food reward and anxiety-like behaviour in rats. *Behav Brain Res*. 2017 Apr 5;328:95-104

Yilmaz Z, Szatkiewicz JP, Crowley JJ, Ancalade N, Brandys MK, van Elburg A, de Kovel CG, **Adan RA**, Hinney A, Hebebrand J, Gratacos M, Fernandez-Aranda F, Escaramis G, Gonzalez JR, Estivill X, Zeggini E, Sullivan PF, Bulik CM Exploration of large, rare copy number variants associated with psychiatric and neurodevelopmental disorders in individuals with anorexia nervosa. Genetic Consortium for Anorexia Nervosa, Wellcome Trust Case Control Consortium 3. *Psychiatr Genet*. 2017 Aug;27(4):152-158

Pandit R, Beerens S, **Adan RA**. The role of leptin in energy expenditure: The hypothalamic perspective. *Am J Physiol Regul Integr Comp Physiol*. 2017 Jun 1;312(6):R938-R947.

Boekhoudt L, Roelofs TJM, de Jong JW, de Leeuw AE, Luijendijk MCM, Wolterink-Donselaar IG, van der Plasse G, **Adan RAH**. Does activation of midbrain dopamine neurons promote or reduce feeding? *Int J Obes (Lond)*. 2017 Jul;41(7):1131-1140.

Ahrens W, Siani A, **Adan R**, De Henauw S, Eiben G, Gwozdz W, Hebestreit A, Hunsberger M, Kaprio J, Krogh V, Lissner L, Molnár D, Moreno LA, Page A, Picó C, Reisch L, Smith RM, Tornaritis M, Veidebaum T, Williams G, Pohlabeln H, Pigeot I; I.Family consortium. Cohort Profile: The transition from childhood to adolescence in European children-how I.Family extends the IDEFICS cohort. *Int J Epidemiol*. 2017 Oct 1;46(5):1394-1395

Leng G, **Adan RA**, Belot M, Brunstrom JM, de Graaf K, Dickson SL, Hare T, Maier S, Menzies J, Preissl H, Reisch LA, Rogers PJ, Smeets PA The determinants of food choice. *Proc Nutr Soc*. 2016 Dec 1:1-12

van Meer F, van der Laan LN, Charbonnier L, Viergever MA, **Adan RA**, Smeets PA; I.Family Consortium.. Developmental differences in the brain response to unhealthy food cues: an fMRI study of children and adults. *Am J Clin Nutr*. 2016 Dec;104(6):1515-1522.

Boekhoudt L, Voets ES, Flores-Dourojeanni JP, Luijendijk MC, Vanderschuren LJ, **Adan RA** Chemogenetic Activation of Midbrain Dopamine Neurons Affects Attention, but not Impulsivity, in the Five-Choice Serial Reaction Time Task in Rats. *Neuropsychopharmacology*. 2017 May;42(6):1315-1325

Boekhoudt L, Omrani A, Luijendijk MC, Wolterink-Donselaar IG, Wijbrans EC, van der Plasse G, **Adan RA**. Chemogenetic activation of dopamine neurons in the ventral tegmental area, but not substantia nigra, induces hyperactivity in rats. *Eur Neuropsychopharmacol*. 2016 Nov;26(11):1784-1793

Beloate LN, Omrani A, **Adan RA**, Webb IC, Coolen LM. Ventral Tegmental Area Dopamine Cell Activation during Male Rat Sexual Behavior Regulates Neuroplasticity and d-Amphetamine Cross-Sensitization following Sex Abstinence. *J Neurosci*. 2016 Sep 21;36(38):9949-61

Johannessen H, Revesz D, Kodama Y, Cassie N, Skibicka KP, Barrett P, Dickson S, Holst J, Rehfeld J, van der Plasse G, **Adan R**, Kulseng B, Ben-Menachem E, Zhao CM, Chen D. Vagal Blocking for Obesity Control: a Possible Mechanism-Of-Action. *Obes Surg*. 2017 Jan;27(1):177-185

Imbernon M, Sanchez-Rebordelo E, Romero-Picó A, Kalló I, Chee MJ, Porteiro B, Al-Massadi O, Contreras C, Fernø J, Senra A, Gallego R, Folgueira C, Seoane LM, van Gestel M, **Adan RA**, Liposits Z, Dieguez C, López M, Nogueiras R. Hypothalamic kappa opioid receptor mediates both diet-induced and melanin concentrating hormone-induced liver damage through inflammation and endoplasmic reticulum stress. *Hepatology*. 2016 Oct;64(4):1086-104.

Sultson H, van Meer F, Sanders N, van Elburg AA, Danner UN, Hoek HW, **Adan RA**, Smeets PA. Associations between neural correlates of visual stimulus processing and set-shifting in ill and recovered women with anorexia nervosa. *Psychiatry Res.* 2016 Jul 9;255:35-42

Hinney A, Kesselmeier M, Jall S, Volckmar AL, Föcker M, Antel J; GCAN; WTCCC3, Heid IM, Winkler TW; GIANT, Grant SF; EGG, Guo Y, Bergen AW, Kaye W, Berrettini W, Hakonarson H; Price Foundation Collaborative Group; Children's Hospital of Philadelphia/Price Foundation, Herpertz-Dahlmann B, de Zwaan M, Herzog W, Ehrlich S, Zipfel S, Egberts KM, **Adan R**, Brandys M, van Elburg A, Boraska Perica V, Franklin CS, Tschöp MH, Zeggini E, Bulik CM, Collier D, Scherag A, Müller TD, Hebebrand J. Evidence for three genetic loci involved in both anorexia nervosa risk and variation of body mass index. *Mol Psychiatry.* 2016 Feb;22(2):321-322

Schmidt U, **Adan R**, Böhm I, Campbell IC, Dingemans A, Ehrlich S, Elzackers I, Favaro A, Giel K, Harrison A, Himmerich H, Hoek HW, Herpertz-Dahlmann B, Kas MJ, Seitz J, Smeets P, Sternheim L, Tenconi E, van Elburg A, van Furth E, Zipfel S. Eating disorders: the big issue. *Lancet Psychiatry.* 2016 Apr;3(4):313-5

Pandit R, Omrani A, Luijendijk MC, de Vrind VA, Van Rozen AJ, Ophuis RJ, Garner K, Kallo I, Ghanem A, Liposits Z, Conzelmann KK, Vanderschuren LJ, la Fleur SE, **Adan RA**. Melanocortin 3 Receptor Signaling in Midbrain Dopamine Neurons Increases the Motivation for Food Reward. *Neuropsychopharmacology.* 2016 Aug;41(9):2241-51

van den Heuvel JK, Eggels L, van Rozen AJ, Fliers E, Kalsbeek A, **Adan RA**, la Fleur SE. Inhibitory Effect of the Melanocortin Receptor Agonist Melanotan-II (MTII) on Feeding Depends on Dietary Fat Content and not Obesity in Rats on Free-Choice Diets. *Front Behav Neurosci.* 2015 Dec 24;9:358

Schmidlin T, Boender AJ, Frese CK, Heck AJ, **Adan RA**, Altelaar AF. Diet-induced neuropeptide expression: feasibility of quantifying extended and highly charged endogenous peptide sequences by selected reaction monitoring. *Anal Chem.* 2015 Oct 6;87(19):9966-7

van der Plasse G, van Zessen R, Luijendijk MC, Erkan H, Stuber GD, Ramakers GM, **Adan RA**. Modulation of cue-induced firing of ventral tegmental area dopamine neurons by leptin and ghrelin. *Int J Obes (Lond).* 2015 Dec;39(12):1742-9

Brandys MK, de Kovel CG, Kas MJ, van Elburg AA, **Adan RA**. Overview of genetic research in anorexia nervosa: The past, the present and the future. *Int J Eat Disord.* 2015 Nov;48(7):814-25.

Pandit R, van der Zwaal EM, Luijendijk MC, Brans MA, van Rozen AJ, Oude Ophuis RJ, Vanderschuren LJ, **Adan RA**, la Fleur SE. Central melanocortins regulate the motivation for sucrose reward. *PLoS One.* 2015 Mar 26;10(3):e0121768

de Jong JW, Roelofs TJ, Mol FM, Hillen AE, Meijboom KE, Luijendijk MC, van der Eerden HA, Garner KM, Vanderschuren LJ, **Adan RA**. Reducing Ventral Tegmental Dopamine D2 Receptor Expression Selectively Boosts Incentive Motivation. *Neuropsychopharmacology.* 2015 Aug;40(9):2085-95.

de Git KC, **Adan RA**. Leptin resistance in diet-induced obesity: the role of hypothalamic inflammation. *Obes Rev.* 2015 Mar;16(3):207-24

van Gestel MA, Sanders LE, de Jong JW, Luijendijk MC, **Adan RA**. FTO knockdown in rat ventromedial hypothalamus does not affect energy balance. *Physiol Rep.* 2014 Dec 11;2(12)

van Meer F, van der Laan LN, **Adan RA**, Viergever MA, Smeets PA. What you see is what you eat: an ALE meta-analysis of the neural correlates of food viewing in children and adolescents. *Neuroimage*. 2015 Jan 1;104:35-43

Sanders N, Smeets PA, van Elburg AA, Danner UN, van Meer F, Hoek HW, **Adan RA**. Altered food-cue processing in chronically ill and recovered women with anorexia nervosa. *Front Behav Neurosci*. 2015 Feb 27;9:46.

Hebebrand J, Albayrak Ö, **Adan R**, Antel J, Dieguez C, de Jong J, Leng G, Menzies J, Mercer JG, Murphy M, van der Plasse G, Dickson SL. "Eating addiction", rather than "food addiction", better captures addictive-like eating behavior. *Neurosci Biobehav Rev*. 2014 Nov;47:295-306.

Boender AJ, van Gestel MA, Garner KM, Luijendijk MC, **Adan RA**. The obesity-associated gene *Negr1* regulates aspects of energy balance in rat hypothalamic areas. *Physiol Rep*. 2014 Jul 30;2(7).

van Swieten MM, Pandit R, **Adan RA**, van der Plasse G. The neuroanatomical function of leptin in the hypothalamus. *J Chem Neuroanat*. 2014 Nov;61-62:207-20

van Gestel MA, Kostrzewa E, **Adan RA**, Janhunen SK. Pharmacological manipulations in animal models of anorexia and binge eating in relation to humans. *Br J Pharmacol*. 2014 Oct;171(20):4767-84.

van Gestel MA, Boender AJ, de Vrind VA, Garner KM, Luijendijk MC, **Adan RA**. Recombinant adeno-associated virus: efficient transduction of the rat VMH and clearance from blood. *PLoS One*. 2014 May 23;9(5):e97639.

Boender AJ, de Jong JW, Boekhoudt L, Luijendijk MC, van der Plasse G, **Adan RA**. Combined Use of the Canine Adenovirus-2 and DREADD-Technology to Activate Specific Neural Pathways In Vivo. *PLoS One*. 2014 Apr 15;9(4):e95392.

Oude Ophuis RJ, Boender AJ, van Rozen AJ, **Adan RA**. Cannabinoid, melanocortin and opioid receptor expression on DRD1 and DRD2 subpopulations in rat striatum. *Front Neuroanat*. 2014 Mar 26;8:14.

Boender AJ, Koning NA, van den Heuvel JK, Luijendijk MC, van Rozen AJ, la Fleur SE, **Adan RA**. AAV-Mediated Gene Transfer of the Obesity-Associated Gene *Etv5* in Rat Midbrain Does Not Affect Energy Balance or Motivated Behavior. *PLoS One*. 2014 Apr 7;9(4):e94159.

van den Heuvel JK, Eggels L, van Rozen AJ, Luijendijk MC, Fliers E, Kalsbeek A, **Adan RA**, la Fleur SE. Neuropeptide Y and leptin sensitivity is dependent on diet composition. *J Neuroendocrinol*. 2014 Jun;26(6):377-85.

Sternheim L, Danner U, **Adan R**, van Elburg A. Drive for activity in patients with anorexia nervosa. *Int J Eat Disord*. 2015 Jan;48(1):42-5.

Meye FJ, Ramakers GM, **Adan RA**. The vital role of constitutive GPCR activity in the mesolimbic dopamine system. *Transl Psychiatry*. 2014 Feb 11;4:e361

Boraska V...**Adan RA**... Bulik C A genome-wide association study of anorexia nervosa. *Mol Psychiatry*. 2014 Oct;19(10):1085-94



Pandit R, Luijendijk MC, Vanderschuren LJ, la Fleur SE, **Adan RA**. Limbic substrates of the effects of neuropeptide Y on intake of and motivation for palatable food. *Obesity (Silver Spring)*. 2014 May;22(5):1216-1219

van den Heuvel JK, Eggels L, Fliers E, Kalsbeek A, **Adan RA**, la Fleur SE. Differential modulation of arcuate nucleus and mesolimbic gene expression levels by central leptin in rats on short-term high-fat high-sugar diet. *PLoS One*. 2014 Jan 31;9(1):e87729

van Gestel MA, van Erp S, Sanders LE, Brans MA, Luijendijk MC, Merkestein M, Pasterkamp RJ, **Adan RA**. shRNA-induced saturation of the microRNA pathway in the rat brain. *Gene Ther*. 2014 Feb;21(2):205-11

Meye FJ, **Adan RA**. Feelings about food: the ventral tegmental area in food reward and emotional eating. *Trends Pharmacol Sci*. 2014 Jan;35(1):31-40

van der Zwaal EM, Janhunen SK, la Fleur SE, **Adan RA**. Modelling olanzapine-induced weight gain in rats. *Int J Neuropsychopharmacol*. 2014 Jan;17(1):169-86.

Kostrzewa E, van Elburg AA, Sanders N, Sternheim L, **Adan RA**, Kas MJ. Longitudinal changes in the physical activity of adolescents with anorexia nervosa and their influence on body composition and leptin serum levels after recovery. *PLoS One*. 2013 Oct 21;8(10):e78251

de Jong JW, Meijboom KE, Vanderschuren LJ, **Adan RA**. Low Control over Palatable Food Intake in Rats Is Associated with Habitual Behavior and Relapse Vulnerability: Individual Differences. *PLoS One*. 2013 Sep 10;8(9):e74645

la Fleur SE, Luijendijk MC, van der Zwaal EM, Brans MA, **Adan RA**. The snacking rat as model of human obesity: effects of a free-choice high-fat high-sugar diet on meal patterns. *Int J Obes (Lond)*. 2014 May;38(5):643-9.

Janhunen SK, la Fleur SE, **Adan RA**. Blocking alpha2A adrenoceptors, but not dopamine receptors, augments bupropion-induced hypophagia in rats. *Obesity* 2013 Dec;21(12):E700-8

Merkestein M, van Gestel MA, van der Zwaal EM, Brans MA, Luijendijk MC, van Rozen AJ, Hendriks J, Garner KM, Boender AJ, Pandit R, **Adan R**. GHS-R1a signaling in the DMH and VMH contributes to food anticipatory activity. *Int J Obes (Lond)*. 2014 Apr;38(4):610-8.

Pandit R, la Fleur SE, **Adan RA**. The role of melanocortins and Neuropeptide Y in food reward. *Eur J Pharmacol*. 2013 Nov 5;719(1-3):208-14

Mul JD, Spruijt BM, Brakkee JH, **Adan RA**. Melanocortin MC4 receptor-mediated feeding and grooming in rodents. *Eur J Pharmacol*. 2013 Nov 5;719(1-3):192-201.

Alserda E, **Adan RA**, Ramakers GM. Repeated agouti related peptide (83-132) injections inhibit cocaine-induced locomotor sensitisation, but not via the nucleus accumbens. *Eur J Pharmacol*. 2013 Nov 5;719(1-3):187-91.

Frese CK, Boender AJ, Mohammed S, Heck AJ, **Adan RA**, Altelaar AF. Profiling of diet-induced neuropeptide changes in rat brain by quantitative mass spectrometry. *Anal Chem*. 2013 May 7;85(9):4594-604

Romero-Picó A, Vázquez MJ, González-Touceda D, Folgueira C, Skibicka KP, Alvarez-Crespo M, Van Gestel MA, Velásquez DA, Schwarzer C, Herzog H, López M, **Adan RA**, Dickson SL,

Diéguez C, Nogueiras R. Hypothalamic Kappa Opioid Receptor Modulates the Orexigenic Effect of Ghrelin. *Neuropsychopharmacology*. 2013 Jun;38(7):1296-307

**Adan RA**. Mechanisms underlying current and future anti-obesity drugs. *Trends Neurosci*. 2013 Feb;36(2):133-40.

Pjetri E, de Haas R, de Jong S, Gelegen C, Oppelaar H, Verhagen LA, Eijkemans MJ, **Adan RA**, Olivier B, Kas MJ. Identifying predictors of activity based anorexia susceptibility in diverse genetic rodent populations. *PLoS One*. 2012;7(11):e5045

Meye FJ, van Zessen R, Smidt MP, **Adan RA**, Ramakers GM. Morphine withdrawal enhances constitutive  $\mu$ -opioid receptor activity in the ventral tegmental area. *J Neurosci*. 2012 Nov 14;32(46):16120-8

Meye FJ, Trezza V, Vanderschuren LJ, Ramakers GM, **Adan RA**. Neutral antagonism at the cannabinoid 1 receptor: a safer treatment for obesity. *Mol Psychiatry*. 2013 Dec;18(12):1294-301

van der Plasse G, Merkestein M, Lujendijk MC, van der Roest M, Westenberg HG, Mulder AB, **Adan RA**. Food cues and ghrelin recruit the same neuronal circuitry. *Int J Obes (Lond)*. 2013 Jul;37(7):1012-9.

Carrera O, **Adan RA**, Gutierrez E, Danner UN, Hoek HW, van Elburg AA, Kas MJ. Hyperactivity in anorexia nervosa: warming up not just burning-off calories. *PLoS One*. 2012;7(7):e41851

van Zessen R, van der Plasse G, **Adan RA**. Contribution of the mesolimbic dopamine system in mediating the effects of leptin and ghrelin on feeding. *Proc Nutr Soc*. 2012 Nov;71(4):435-45

Pandit R, Mercer JG, Overduin J, la Fleur SE, **Adan RA**. Dietary Factors Affect Food Reward and Motivation to Eat. *Obes Facts*. 2012 Apr 20;5(2):221-242

de Jong JW, Vanderschuren LJ, **Adan RA**. Towards an Animal Model of Food Addiction. *Obes Facts*. 2012 Apr 19;5(2):180-195

Boender AJ, van Rozen AJ, **Adan RA**. Nutritional state affects the expression of the obesity-associated genes *Etv5*, *Faim2*, *Fto*, and *Negr1*. *Obesity (Silver Spring)*. 2012 Dec;20(12):2420-5

Cardona Cano S, Merkestein M, Skibicka KP, Dickson SL, **Adan RA**. Role of ghrelin in the pathophysiology of eating disorders: implications for pharmacotherapy. *CNS Drugs*. 2012 Apr 1;26(4):281-96.

Brandys MK, Slof-Op't Landt MC, van Elburg AA, Ophoff R, Verduijn W, Meulenbelt I, Middeldorp CM, Boomsma DI, van Furth EF, Slagboom E, Kas MJ, **Adan RA**. Anorexia nervosa and the Val158Met polymorphism of the COMT gene: meta-analysis and new data. *Psychiatr Genet*. 2012 Jun;22(3):130-6

Danner UN, Sanders N, Smeets PA, van Meer F, **Adan RA**, Hoek HW, van Elburg AA. Neuropsychological weaknesses in anorexia nervosa: set-shifting, central coherence, and decision making in currently ill and recovered women. *Int J Eat Disord*. 2012 Jul;45(5):685-94

van der Zwaal EM, Janhunen SK, Lujendijk MC, Baclesanu R, Vanderschuren LJ, **Adan RA**, La Fleur SE. Olanzapine and sibutramine have opposing effects on the motivation for palatable food. *Behav Pharmacol*. 2012 Apr;23(2):198-204

Merkestein M, Brans MA, Luijendijk MC, de Jong JW, Egecioglu E, Dickson SL, **Adan RA**. Ghrelin mediates anticipation to a palatable meal in rats. *Obesity (Silver Spring)*. 2012 May;20(5):963-71

Verhagen LA, Luijendijk MC, de Groot JW, van Dommelen LP, Klimstra AG, **Adan RA**, Roeling TA. Anticipation of meals during restricted feeding increases activity in the hypothalamus in rats. *Eur J Neurosci*. 2011 Nov;34(9):1485-91

Brandys MK, Kas MJ, van Elburg AA, Ophoff R, Slob-Op't Landt MC, Middeldorp CM, Boomsma DI, van Furth EF, Slagboom PE, **Adan RA**. The Val66Met polymorphism of the BDNF gene in anorexia nervosa: New data and a meta-analysis. *World J Biol Psychiatry*. 2011 Sep 21

Pjetri E, **Adan RA**, Herzog H, de Haas R, Oppelaar H, Spierenburg HA, Olivier B, Kas MJ. NPY receptor subtype specification for behavioral adaptive strategies during limited food access. *Genes Brain Behav*. 2012 Feb;11(1):105-12.

de Backer MW, Garner KM, Luijendijk MC, **Adan RA**. Recombinant adeno-associated viral vectors. *Methods Mol Biol*. 2011;789:357-76.

Mul JD, la Fleur SE, Toonen PW, Afrasiab-Middelmann A, Binnekade R, Schetters D, Verheij MM, Sears RM, Homberg JR, Schoffelmeer AN, **Adan RA**, DiLeone RJ, De Vries TJ, Cuppen E. Chronic loss of melanin-concentrating hormone affects motivational aspects of feeding in the rat. *PLoS One*. 2011 May 5;6(5):e19600

van der Zwaal EM, Merkestein M, Lam YK, Brans MA, Luijendijk MC, Bok LI, Verheij ER, la Fleur SE, **Adan RA**. The acute effects of olanzapine on ghrelin secretion, CCK sensitivity, meal size, locomotor activity and body temperature. *Int J Obes (Lond)*. 2012 Feb;36(2):254-61

Mul JD, van Bortel R, Bergen DJ, Brans MA, Brakkee JH, Toonen PW, Garner KM, **Adan RA**, Cuppen E. Melanocortin receptor 4 deficiency affects body weight regulation, grooming behavior, and substrate preference in the rat. *Obesity (Silver Spring)*. 2012 Mar;20(3):612-21

van Elburg AA, Hillebrand JJ, Huyser C, Snoek M, Kas MJ, Hoek HW, **Adan RA**. Mandomator treatment not superior to treatment as usual for anorexia nervosa. *Int J Eat Disord*. 2012 Mar;45(2):193-201

Brandys MK, Kas MJ, van Elburg AA, Campbell IC, **Adan RA**. A meta-analysis of circulating BDNF concentrations in anorexia nervosa. *World J Biol Psychiatry*. 2011 Sep;12(6):444-54

Janhunen SK, van der Zwaal EM, la Fleur SE, **Adan RA**. Inverse agonism at  $\alpha 2A$  adrenoceptors augments the hypophagic effect of sibutramine in rats. *Obesity (Silver Spring)*. 2011 Oct;19(10):1979-86

Pandit R, de Jong JW, Vanderschuren LJ, **Adan RA**. Neurobiology of overeating and obesity: the role of melanocortins and beyond. *Eur J Pharmacol*. 2011 Jun 11;660(1):28-42

**Adan RA**, Hillebrand JJ, Danner UN, Cardona Cano S, Kas MJ, Verhagen LA. Neurobiology driving hyperactivity in activity-based anorexia. *Curr Top Behav Neurosci*. 2011;6:229-50

Kas MJ, **Adan RA**. Animal models of eating disorder traits. *Curr Top Behav Neurosci*. 2011;6:209-27

Ternouth A, Brandys MK, van der Schouw YT, Hendriks J, Jansson JO, Collier D, **Adan RA**. Association study of POMC variants with body composition measures and nutrient choice. *Eur J Pharmacol*. 2011 Jun 11;660(1):220-5

de Backer MW, la Fleur SE, **Adan RA**. Both overexpression of agouti-related peptide or neuropeptide Y in the paraventricular nucleus or lateral hypothalamus induce obesity in a neuropeptide- and nucleus specific manner. *Eur J Pharmacol*. 2011 Jun 11;660(1):148-55

Van den Heuvel JK, van Rozen AJ, **Adan RA**, la Fleur SE. An overview on how components of the melanocortin system respond to different high energy diets. *Eur J Pharmacol*. 2011 Jun 11;660(1):207-12

Verhagen LA, Luijendijk MC, **Adan RA**. Leptin reduces hyperactivity in an animal model for anorexia nervosa via the ventral tegmental area. *Eur Neuropsychopharmacol*. 2011 Mar;21(3):274-81

van den Berg L, van Beekum O, Heutink P, Felius BA, van de Heijning MP, Strijbis S, van Spaendonk R, Pincatelli D, Garner KM, El Aouad R, Sistermans E, **Adan RA**, Delemarre-van de Waal HA. Melanocortin-4 receptor gene mutations in a Dutch cohort of obese children. *Obesity (Silver Spring)*. 2011 Mar;19(3):604-11. doi: 10.1038/oby.2010.259.

Slof-Op 't Landt MC, Meulenbelt I, Bartels M, Suchiman E, Middeldorp CM, Houwing-Duistermaat JJ, van Trier J, Onkenhout EJ, Vink JM, van Beijsterveldt CE, Brandys MK, Sanders N, Zipfel S, Herzog W, Herpertz-Dahlmann B, Klampfl K, Fleischhaker C, Zeeck A, de Zwaan M, Herpertz S, Ehrlich S, van Elburg AA, **Adan RA**, Scherag S, Hinney A, Hebebrand J, Boomsma DI, van Furth EF, Slagboom PE. Association study in eating disorders: TPH2 associates with anorexia nervosa and self-induced vomiting. *Genes Brain Behav*. 2011 Mar;10(2):236-43

de Backer MW, Brans MA, van Rozen AJ, van der Zwaal EM, Luijendijk MC, Garner KG, de Krom M, van Beekum O, la Fleur SE, **Adan RA**. Suppressor of cytokine signaling 3 knockdown in the mediobasal hypothalamus: counterintuitive effects on energy balance. *J Mol Endocrinol*. 2010 Nov;45(5):341-53

de Backer MW, la Fleur SE, Brans MA, van Rozen AJ, Luijendijk MC, Merkesteyn M, Garner KM, van der Zwaal EM, **Adan RA**. Melanocortin receptor-mediated effects on obesity are distributed over specific hypothalamic regions. *Int J Obes (Lond)*. 2011 May;35(5):629-41

la Fleur SE, Luijendijk MC, van Rozen AJ, Kalsbeek A, **Adan RA**. A free-choice high-fat high-sugar diet induces glucose intolerance and insulin unresponsiveness to a glucose load not explained by obesity. *Int J Obes (Lond)*. 2011 Apr;35(4):595-604

de Backer MW, Brans MA, Luijendijk MC, Garner KM, van den Heuvel DM, Pasterkamp RJ, **Adan RA**. Neuropeptide delivery to the brain: a von Willebrand factor signal peptide to direct neuropeptide secretion. *BMC Neurosci*. 2010 Aug 11;11:94

de Backer MW, Fitzsimons CP, Brans MA, Luijendijk MC, Garner KM, Vreugdenhil E, **Adan RA**. An adeno-associated viral vector transduces the rat hypothalamus and amygdala more efficient than a lentiviral vector. *BMC Neurosci*. 2010 Jul 13;11:81

Verhagen LA, Egecioglu E, Luijendijk MC, Hillebrand JJ, **Adan RA**, Dickson SL.

Acute and chronic suppression of the central ghrelin signaling system reveals a role in food anticipatory activity. *Eur Neuropsychopharmacol.* 2011 May;21(5):384-92

Schipper HS, de Jager W, van Dijk ME, Meerding J, Zelissen PM, **Adan RA**, Prakken BJ, Kalkhoven E. A multiplex immunoassay for human adipokine profiling. *Clin Chem.* 2010 Aug;56(8):1320-8.

van der Zwaal EM, Luijendijk MC, Evers SS, la Fleur SE, **Adan RA**. Olanzapine affects locomotor activity and meal size in male rats. *Pharmacol Biochem Behav.* 2010 Nov;97(1):130-7

Jethwa PH, Warner A, Fowler MJ, Murphy M, de Backer MW, **Adan RA**, Barrett P, Brameld JM, Ebling FJ. Short-days induce weight loss in Siberian hamsters despite overexpression of the agouti-related peptide gene. *J Neuroendocrinol.* 2010 Jun;22(6):564-75

de Backer M, Brans M, Luijendijk M, Garner K, **Adan R**. Optimization of adeno-associated viral vector mediated gene delivery to the hypothalamus. *Hum Gene Ther.* 2010 Jun;21(6):673-82

la Fleur SE, van Rozen AJ, Luijendijk MC, Groeneweg F, **Adan RA**. A free-choice high-fat high-sugar diet induces changes in arcuate neuropeptide expression that support hyperphagia. *Int J Obes (Lond).* 2010 Mar;34(3):537-46

Brandys MK, van Elburg AA, Loos RJ, Bauer F, Hendriks J, van der Schouw YT, **Adan RA**. Are recently identified genetic variants regulating BMI in the general population associated with anorexia nervosa? *Am J Med Genet B Neuropsychiatr Genet.* 2010 Mar 5;153B(2):695-9

Luijendijk MCM, Brakkee JH, Boskovic E, van den Vosse R, Ligtoet CM, La Fleur SE, van der Zwaal EM, **Adan RAH**. Weet hoe je dier eet! Automatische registratie van voedselpatronen. *BIOTECHNIEK* 2010;49(4):

Bauer F, Elbers CC, **Adan RA**, Loos RJ, Onland-Moret NC, Grobbee DE, van Vliet-Ostapchouk JV, Wijmenga C, van der Schouw YT. Obesity genes identified in genome-wide association studies are associated with adiposity measures and potentially with nutrient-specific food preference. *Am J Clin Nutr.* 2009 Oct;90(4):951-9

Tiesjema B, la Fleur SE, Luijendijk MC, **Adan RA**. Sustained NPY overexpression in the PVN results in obesity via temporarily increasing food intake. *Obesity (Silver Spring).* 2009 Jul;17(7):1448-50

de Krom M, Bauer F, Collier D, **Adan RA**, la Fleur SE. Genetic variation and effects on human eating behavior. *Annu Rev Nutr.* 2009;29:283-304

Altelaar AF, Mohammed S, Brans MA, **Adan RA**, Heck AJ. Improved identification of endogenous peptides from murine nervous tissue by multiplexed peptide extraction methods and multiplexed mass spectrometric analysis. *J Proteome Res.* 2009 Feb;8(2):870-6.

Verhagen LA, Luijendijk MC, Korte-Bouws GA, Korte SM, **Adan RA**. Dopamine and serotonin release in the nucleus accumbens during starvation-induced hyperactivity. *Eur Neuropsychopharmacol.* 2009 May;19(5):309-16

van Hooijdonk LW, Ichwan M, Dijkmans TF, Schouten TG, de Backer MW, **Adan RA**, Verbeek FJ, Vreugdenhil E, Fitzsimons CP. Lentivirus-mediated transgene delivery to the hippocampus reveals sub-field specific differences in expression. *BMC Neurosci.* 2009 Jan 13;10:2

Verhagen LA, Luijendijk MC, Hillebrand JJ, **Adan RA**. Dopamine antagonism inhibits anorectic behavior in an animal model for anorexia nervosa. *Eur Neuropsychopharmacol*. 2009 Mar;19(3):153-60

**Adan RA**, Vanderschuren LJ, la Fleur SE. Anti-obesity drugs and neural circuits of feeding. *Trends Pharmacol Sci*. 2008, 29(4):208-17

Hillebrand JJ, Kas MJ, van Elburg AA, Hoek HW, **Adan RA**. Leptin's effect on hyperactivity: potential downstream effector mechanisms. *Physiol Behav*. 2008 Aug 6;94(5):689-95

van Abeelen AF, de Krom M, Hendriks J, Grobbee DE, **Adan RA**, van der Schouw YT. Variations in the uncoupling protein-3 gene are associated with specific obesity phenotypes. *Eur J Endocrinol*. 2008 May;158(5):669-76

van der Zwaal EM, Luijendijk MC, **Adan RA**, la Fleur SE. Olanzapine-induced weight gain: chronic infusion using osmotic minipumps does not result in stable plasma levels due to degradation of olanzapine in solution. *Eur J Pharmacol*. 2008 May 6;585(1):130-6

Tiesjema B, **Adan RA**, Luijendijk MC, Kalsbeek A, la Fleur SE. Differential effects of recombinant adeno-associated virus-mediated neuropeptide Y overexpression in the hypothalamic paraventricular nucleus and lateral hypothalamus on feeding behavior. *J Neurosci*. 2007 27(51):14139-46

Tiesjema B, Merkesteyn M, Garner KM, de Krom M, **Adan RA**. Multimeric alpha-MSH has increased efficacy to activate the melanocortin MC4 receptor. *Eur J Pharmacol*. 2008 May 6;585(1):24-30.

Remmers F, Verhagen LA, **Adan RA**, Delemarre-van de Waal HA. Hypothalamic neuropeptide expression of juvenile and middle-aged rats after early postnatal food restriction. *Endocrinology*. 2008 Jul;149(7):3617-25

la Fleur SE, Vanderschuren LJMJ, Luijendijk MC, Kloeze BM, Tiesjema B and **Adan RAH**

A reciprocal interaction between food-motivated behavior and diet-induced obesity *Int J Obes* 2007 Aug;31(8):1286-94

Tiesjema B, la Fleur SE, Luijendijk MCM, Brans MAD, Lin ED During MJ, **Adan RA** Injection of rAAV-NPY in the paraventricular nucleus results in obesity. *Obesity research* 2007 15(10):2424-35.

de Krom M, van der Schouw YT, Hendriks J, Ophoff RA, van Gils CH, Stolk RP, Grobbee DE, **Adan R**. Common genetic variations in CCK, leptin, and leptin receptor genes are associated with specific human eating patterns. *Diabetes*. 2007 Jan;56(1):276-80.

Gelegen C, Collier DA, Campbell IC, Oppelaar H, van den Heuvel J, **Adan RA**, Kas MJ. Difference in susceptibility to activity-based anorexia in two inbred strains of mice. *Eur Neuropsychopharmacol*. 2007 Feb;17(3):199-205

de Krom M, Hendriks J, Hillebrand J, van Elburg A, **Adan R**. A polymorphism in the 3' untranslated region of the CCK gene is associated with anorexia nervosa in Dutch patients. *Psychiatr Genet*. 2006 Dec;16(6):239.

**Adan RA**, Tiesjema B, Hillebrand JJ, la Fleur SE, Kas MJ, de Krom M. The MC4 receptor and control of appetite. *Br J Pharmacol*. 2006 Dec;149(7):815-27.

**Adan RA**, Endogenous inverse agonists and constitutive receptor activity in the melanocortin system. *Trends Pharmacol Sci.* 2006 Apr;27(4):183-6

van Rossum CT, Pijl H, **Adan RA**, Hoebee B, Seidell JC. Polymorphisms in the NPY and AGRP genes and body fatness in Dutch adults. *Int J Obes (Lond).* 2006 Oct;30(10):1522-8.

**Adan, R.A.H.**, & Dijk, G. van. Melanocortin receptors as drug targets for disorders of energy balance. *CNS Neurol Disord Drug Targets*, (2006) 5(3), 251-261.

Hillebrand JJ, Heinsbroek AC, Kas MJ, **Adan RA**. The appetite suppressant d-fenfluramine reduces water intake, but not food intake, in activity-based anorexia. *J Mol Endocrinol.* 2006 ; 36(1):153-62.

Hillebrand JJ, Kas MJ, **Adan RA**. To eat or not to eat; regulation by the melanocortin system. *Physiol Behav.* 2006 Aug 30;89(1):97-102

Altelaar AF, Klinkert I, Jalink K, de Lange RP, **Adan RA**, Heeren RM, Piersma SR. Gold-enhanced biomolecular surface imaging of cells and tissue by SIMS and MALDI mass spectrometry. *Anal Chem.* 2006;78(3):734-42

Hillebrand JJ, Kas MJ, Scheurink AJ, van Dijk G, **Adan RA**. AgRP((83-132)) and SHU9119 differently affect activity-based anorexia. *Eur Neuropsychopharmacol.* 2006 Aug;16(6):403-12.

Krom M, de Rijke CE, Hendriks J, Engeland H, van Elburg AA, **Adan RA**. Mutation analysis of the agouti related protein promoter region and the melanocortin-3 receptor in anorexia nervosa patients. *Psychiatr Genet.* 2005 Dec;15(4):237

de Rijke CE, Hillebrand JJ, Verhagen LA, Roeling TA, **Adan RA**. Hypothalamic neuropeptide expression following chronic food restriction in sedentary and wheel-running rats. *J Mol Endocrinol.* 2005 Oct;35(2):381-90.

van Dijk G, de Vries K, Nyakas C, Buwalda B, Adage T, Kuipers F, Kas MJ, **Adan RA**, Wilkinson CW, Thiele TE, Scheurink AJ. Reduced Anorexigenic Efficacy of Leptin, But Not of the Melanocortin Receptor Agonist Melanotan-II, Predicts Diet-Induced Obesity in Rats. *Endocrinology.* 2005 Dec;146(12):5247-56.

Kas MJ, Bruijnzeel AW, Haanstra JR, Wiegant VM, **Adan RA**. Differential regulation of agouti-related protein and neuropeptide Y in hypothalamic neurons following a stressful event. *J Mol Endocrinol.* 2005 Aug;35(1):159-64.

Hillebrand JJ, Koeners MP, de Rijke CE, Kas MJ, **Adan RA**. Leptin treatment in activity-based anorexia. *Biol Psychiatry.* 2005 Jul 15;58(2):165-71.

Hillebrand JJ, van Elburg AA, Kas MJ, van Engeland H, **Adan RA**. Olanzapine reduces physical activity in rats exposed to activity-based anorexia: possible implications for treatment of anorexia nervosa? *Biol Psychiatry.* 2005 Oct 15;58(8):651-7.

Kruijtzter JA, Nijenhuis WA, Wanders N, Gispen WH, Liskamp RM, **Adan RA**. Peptoid-peptide hybrids as potent novel melanocortin receptor ligands. *J Med Chem.* 2005 Jun 30;48(13):4224-30.

Hillebrand JJ, Kas MJ, **Adan RA**. a-MSH enhances activity-based anorexia. *Peptides.* 2005 Oct;26(10):1690-6.

de Rijke CE, Jackson PJ, Garner KM, van Rozen RJ, Douglas NR, Kas MJ, Millhauser GL, **Adan RA**. Functional analysis of the Ala67Thr polymorphism in agouti related protein associated with anorexia nervosa and leanness. *Biochem Pharmacol*. 2005 Jul 15;70(2):308-16

Hillebrand JJ, de Rijke CE, Brakkee JH, Kas MJ, **Adan RA**. Voluntary access to a warm plate reduces hyperactivity in activity-based anorexia. *Physiol Behav*. 2005 Jun 2;85(2):151-7.

de Krom M, Bakker SC, Hendriks J, van Elburg A, Hoogendoorn M, Verduijn W, Sinke R, Kahn R, **Adan RA**. Polymorphisms in the brain-derived neurotrophic factor gene are not associated with either anorexia nervosa or schizophrenia in Dutch patients. *Psychiatr Genet*. 2005 Jun;15(2):81

Wels B, Kruijtzter JA, Garner K, Nijenhuis WA, Gispen WH, **Adan RA**, Liskamp RM. Synthesis of a novel potent cyclic peptide MC4-ligand by ring-closing metathesis. *Bioorg Med Chem*. 2005 Jul 1;13(13):4221-7.

Wels B, Kruijtzter JA, Garner KM, **Adan RA**, Liskamp RM. Synthesis of cyclic peptidosulfonamides as scaffolds for MC4 pharmacophoric groups. *Bioorg Med Chem Lett*. 2005 Jan 17;15(2):287-90.

AgRP, physiological role of an inverse agonist **Roger A.H. Adan**, Wouter A.J. Nijenhuis, Martien J.H. Kas International Congress Series 2329 (2003) pp. 195-206(12)

Martien J. H. Kas, Birgitte Tiesjema, Gertjan van Dijk, Keith M. Garner, Gregory S. Barsh, Olivier Ter Brake, Joost Verhaagen, and **Roger A. H. Adan**. Induction of Brain Region-Specific Forms of Obesity by Agouti *J. Neurosci*. (2004) 24: 10176-10181

Van Elburg, A and **Adan RAH**. Eetstoornissen en obesitas page 303-320 in *Handboek Neurobiologische psychiatrie*, (2004) de Tijdstroom Uitgeverij, Utrecht

Nijenhuis WA, Wanders N, Kruijtzter JA, Liskamp RM, Gispen WH, **Adan RA**. Accelerating sensory recovery after sciatic nerve crush: non-selective versus melanocortin MC4 receptor-selective peptides *Eur J Pharmacol*. 2004 Jul 14;495(2-3):145-52.

Kas, M.J., Van Elburg, A.A., Van Engeland, H., **Adan, R.A.** Refinement of behavioural traits in animals for the genetic dissection of eating disorders. *Eur. J. Pharmacol*. (2003) 480: 13-20.

Kruijtzter, J.A.W., Nijenhuis, W.A.J., Gispen, W.H., **Adan, R.A.H.** and Liskamp, R.M.J.. Peptoid-Peptide Hybrids as Potent Novel Melanocortin Receptor Ligands. In: *Peptide Revolution: Genomics, Proteomics & Therapeutics* Michael Chorev & Tomi K.Sawyer (Editors) American Peptide Society, 2003

Vrinten, D.H., Gispen, W.H., Kalkman, C.J., **Adan, R.A.** Interaction between the spinal melanocortin and opioid systems in a rat model of neuropathic pain. *Anesthesiology* (2003) 99: 449-454.

**Adan, R.A.**, Hillebrand, J.J., De Rijke, C., Nijenhuis, W., Vink, T., Garner, K.M., Kas, M.J. Melanocortin system and eating disorders. *Ann N Y Acad Sci*. (2003) 994: 267-74.

Nijenhuis, W.A.J, Garner, K.M., van Rozen, R.J., **Adan, R.A.H.** Poor cell surface expression of human melanocortin-4 receptor mutations associated with obesity. *J. Biol. Chem* (2003) 278: 22939-22945.



- Adan, R.A.H.** and Kas, M.H.J. Inverse agonism gains weight. *Trends Pharmacol Sci.* (2003) 24: 315-321.
- Nijenhuis, W.A.J., Kruijtzter, J.A.W., Wanders, N.A., Vrinten, D.H., Garner, K.M., Schaaper, W.M.M., Meloen, R.H., Gispen, W.H., Liskamp, R.M., **Adan, R.A.H.** Discovery and in vivo evaluation of new MC4r selective peptides. *Peptides.* (2003) 2: 271-80.
- Kas, M.J.H., Van Dijk, G.J., Scheurink, A.J.W., **Adan, R.A.H.** Agouti-related protein prevents self-starvation. *Mol. Psychiatry* (2003) 8: 235-240.
- Ter Laak, M.P., Brakkee, J.H., **Adan, R.A.**, Hamers. F.P., Gispen, W.H. The potent melanocortin receptor agonist melanotan-II promotes peripheral nerve regeneration and has neuroprotective properties in the rat. *Eur. J. Pharmacol.* (2003) 462:179-183.
- Hillebrand, J.J.G., De Wied, D., **Adan, R.A.H.** Neuropeptides, food intake and body weight regulation: a hypothalamic focus. *Peptides* (2002) 23: 2283-2306.
- Vink, T., Hinney, A., Van Elburg, A., Van Goozen, S., Sandkuijl, L.A., Sinke, R.J., Herpertz-Dahlmann, B.M., Hebebrand, J., Remschmidt, H., Van Engeland, H., **Adan, R.A.H.**
- Association between an AGRP gene polymorphism and Anorexia Nervosa. *Mol. Psychiatry* (2001) 6: 325-328.
- Adage, T., Scheurink, A.J., De Boer, S.F., De Vries, K., Konsman, J.P., Kuipers. F., **Adan, R.A.**, Baskin, D.G., Schwartz, M.W., Van Dijk, G. Hypothalamic, metabolic, and behavioral responses to pharmacological inhibition of CNS melanocortin signaling in rats. *J Neurosci* (2001) 21: 3639-3645.
- Nijenhuis, W.A.J., Oosterom, J., **Adan, R.A.H.** AgRP(83-132) acts as an inverse agonist on the human melanocortin-4 receptor. *Mol. Endocrinology* (2001) 15: 164-171.
- Oosterom, J., Garner, K.M., Den Dekker, W.K., Nijenhuis, W.A.J., Gispen, W.H., Burbach, J.P.H., Barsh, G.S., **Adan, R.A.H.** Common requirements for melanocortin-4 receptor selectivity of structurally unrelated melanocortin agonist and endogenous antagonist, Agouti protein. *J. Biol. Chem.* (2001) 276: 931-936.
- Vrinten, D.H., Kalkman, C.J., **Adan, R.A.**, Gispen, W.H. Neuropathic pain: a possible role for the melanocortin system? *Eur. J. Pharmacol.* (2001) 429: 61-69.
- Adan, R.A.**, Vink, T. Drug target discovery by pharmacogenetics: mutations in the melanocortin system and eating disorders. *Eur. Neuropsychopharmacol* (2001) 11: 483-490
- Vrinten, D.H., **Adan, R.A.**, Groen, G.J., Gispen, W.H. Chronic blockade of melanocortin receptors alleviates allodynia in rats with neuropathic pain *Anesth. Analg.* (2001) 93:1572-1577
- Steffens, A.B., Adage, T., De Vries, K., **Adan. R.A.H.**, Scheurink, A., Van Dijk. G. (2001) Role of leptin signaling system in energy homeostasis. In: *Perspective in Comparative Endocrinology: Unit and Diversity.* (Goos, Rastogi, Vaudry, Pierantoni Eds), International Proceedings Division, Medimond Inc., pp. 993-701.
- Vrinten, D.H., Gispen, W.H., Groen, G.J., **Adan, R.A.H.** Antagonism of the melanocortin system reduces cold and mechanical allodynia in mononeuropathic rats. *J. Neuroscience* 2000, 20: 8131-8137.
- Gispen, W.H., **Adan, R.A.** Preface to pharmacogenomics. *Eur. J. Pharmacol.* (2000) 410: 105.

- Adan, R.A.H.** , Gispen, W.H. Melanocortins and the brain: From effects via receptors to drug targets *Eur J Pharmacol* (2000) 405:13-24.
- Murray, J.F., Mercer, J.G., **Adan, R.A.H.**, Datta, J.J., Aldairy, C., Moar, K.M., Baker, B.I., Stock, M.J., Wilson, C.A. The effect of leptin on luteinizing hormone release is exerted in the zona incerta and mediated by melanin-concentrating hormone. *J. Neuroendocrinol.* 2000, 12: 1133-1139.
- Murray, J.F., **Adan, R.A.**, Walker, R., Baker, B.I., Thody, A.J., Nijenhuis. W.A., Yukitake, J., Wilson, C.A. Melanin-concentrating hormone, melanocortin receptors and regulation of luteinizing hormone release. *J. Neuroendocrinol.* (2000) 12: 217-223.
- Adan, R.A.H.** (2000) Effects of melanocortins in the nervous system. In “The Melanocortin receptors”, edited by R.D. Cone, Humana Press, Chapter 4: 109-142.
- Van der Kraan, M., Tatro, J.B., Entwistle, M.L., Brakkee, J.H., Burbach, J.P., **Adan, R.A.**, Gispen, W.H. Involvement of MC4 receptors in nerve regeneration following sciatic nerve Mol Brain Res (1999) 63: 276-286.
- Oosterom, J., Nijenhuis, W.A.J., Schaaper, W.M.M., Slootstra, J., Meloen, R.H. Burbach, J.P., Gispen, W.H., **Adan, R.A.** Conformation of the core-sequence in melanocortin peptides directs selectivity for the melanocortin MC3 and MC4 receptors. *J. Biol. Chem.* (1999) 274:16853-16860.
- Adan, R.A.H.**, Oosterom, J., Szklarczyk, A.W., Brakkee, J., Schaaper, W., Meloen, R. and Gispen W.H. Pharmacology of brain melanocortin receptor ligands on cloned receptors and on grooming in the rat, *Eur. J. Pharmacol.* (1999) 378: 249-258.
- Gispen, W.H., **Adan, R.A.** Melanocortins and the treatment of nervous system disease. Potential relevance to the skin? *Ann. N.Y. Acad. Sci.* (1999) 885: 342-349.
- Versteeg, D.H., Van Bergen, P., **Adan, R.A.**, De Wildt, D.J. Melanocortins and cardiovascular regulation. *Eur. J. Pharmacol.* (1998) 360: 1-14.
- Schaaper, W.M.M., **Adan, R.A.H.**, Posthuma, T.A., Oosterom, J., Gispen, W.H., and Meloen, R.H. Synthesis of cyclic  $\alpha$ -MSH peptides. *Letters in Peptide Science* (1998) 5:1-4.
- Van der Kraan, M., **Adan, R.A.H.**, Entwistle, M.L., Gispen, W.H., Burbach, J.P.H. and Tatro, J.B. Expression of MC 5 receptor in secretory epithelia supports a functional role in exocrine and endocrine tissues. *Endocrinology* (1998) 139: 2348-2355.
- Oosterom, J., Burbach, J.P., Gispen, W.H., **Adan, R.A.** Asp10 in Lys-gamma2-MSH determines selective activation of the melanocortin MC3 receptor. *Eur. J. Pharmacol.* (1998) 354: R9-11.
- Von Frijtag, J.C., Croiset, G., Gispen, W.H., **Adan, R.A.**, Wiegant, V.M. The role of central melanocortin receptors in the activation of the hypothalamus-pituitary-adrenal-axis and the induction of excessive grooming. *Br. J. Pharmacol.* (1998)123:1503-1508.
- Adan, R.A.H.**, Oosterom, J., Toonen, R.F.G., van der Kraan, M., Burbach, J.P.H. and Gispen W.H. Molecular pharmacology of neural melanocortin receptors. *Receptors and Channels* (1997) 5: 215-223.
- Adan, R.A.H.** and Gispen, W.H. Neural melanocortin receptors: from cloning to function. *Peptides* (1997) 8: 1279-1287.

Quinones-Jenab, V., Jenab, S., Ogawa, S., **Adan, R.A.H.**, Burbach, J.P.H. and Pfaff, D.W. Effects of estrogen on oxytocin receptor messenger ribonucleid acid expression in the uterus, pituitary and forebrain of the female rat. *Mol. Neuroendocrinol.* (1997) 65: 9-17.

**Adan, R.A.H.**, van der Kraan, M., Doornbos, R.P., Burbach, J.P.H. and Gispen, W.H. Melanocortin receptors mediate MSH-induced stimulation of neurite outgrowth in Neuro 2A cells. *Mol. Brain Res.* (1996) 36: 37-44.

**Adan, R.A.H.**, van Leeuwen, F.W., Sonnemans, M.A.F., Brouns, M., Hoffman, G., Verbalis, J.G. and Burbach, J.P.H. The rat oxytocin receptor in brain, pituitary, mammary gland and uterus: partial sequence and immunocytochemical localization. *Endocrinology* (1995) 136: 4022-4028.

Burbach, J.P.H., **Adan, R.A.H.**, Lolait, S.J., Van Leeuwen, F.W., Mezey, E., Palkovits, M. and Barberis, C. Molecular neurobiology and pharmacology of the vasopressin/oxytocin receptor family. *Cell. Mol. Neurobiol.* (1995) 15: 573-595.

Burbach, J.P.H., Van Schaik, H.S.A., De Bree, F.M., Lopes da Silva, S. and **Adan, R.A.H.**, Functional domains in the oxytocin gene for regulation of expression and biosynthesis of gene products. In: *Oxytocin. Cellular and Molecular Approaches in Medicine and Research* (Eds. Richard Ivell and John A Russell) *Adv. Exp. Med. Biol.* (1995) 395: 9-21.

**Adan, R.A.H.**, Van Leeuwen, F.W., Sonnemans, M.A.F., Hoffman, G., Verbalis, J.G. and Burbach, J.P.H. The rat oxytocin receptor. cDNA cloning and immunohistochemical localization in brain, pituitary, mammary gland and uterus. In: *Oxytocin. Cellular and Molecular Approaches in Medicine and Research* (Eds. Richard Ivell and John A Russell) *Adv. Exp. Med. Biol.* (1995) 395: 345-346.

Burbach, J.P.H., Lopes da Silva, S., Cox, J.J., **Adan, R.A.H.**, Cooney, A.J., Tsai, M-J. and Tsai, S.Y. Repression of estrogen-dependent stimulation of the oxytocin gene by COUP transcription factor I. *J. Biol. Chem.* (1994) 269: 15046-15053.

**Adan, R.A.H.**, Oosterom, J., Ludvigsdotter, G., Brakkee, J.H., Burbach, J.P.H. and Gispen, W.H. Identification of antagonists for melanocortin MC3, MC4 and MC5 receptors. *Eur. J. Pharmacol.* (1994) 269: 331-337.

**Adan, R.A.H.**, Cone, R.D., Burbach, J.P.H. and Gispen, W.H. Differential effects of melanocortin peptides on neural melanocortin receptors. *Mol. Pharmacol.* (1994) 46: 1182-1190.

Burbach, J.P.H. and **Adan, R.A.H.** The rat oxytocin gene: Physiological changes in expression in the hypothalamo-neurohypophyseal system and responsiveness of promoter activity. *Ann. N.Y. Acad. of Sci.* (1993) 689: 34-49.

Burbach, J.P.H., **Adan, R.A.H.**, Cox, J.J. and Lopes da Silva, S. Transactivation of the rat oxytocin and vasopressin promoters by nuclear hormone receptors. *Regulatory Peptides* (1993) 45: 31-35.

Lopes da Silva, S, **Adan, R.A.H.** and Burbach, J.P.H. Transcriptional regulation of the rat oxytocin promoter activation and suppression by members of the steroid/thyroid hormone receptor family. *Ann. N.Y. Acad. Sci.* (1993) 684: 227-229.

Burbach, J.P.H., Lopes da Silva, S., van Schaik, S.A, Cox, J.J. and **Adan, R.A.H.** Transcription factors of the supraoptic nucleus: activation and repression of the oxytocin gene. In: Vasopressin. P. Gross, D. Richter and G.L. Robertson eds. 1993, John Libbey Eurotext, pp 95-109.

**Adan, R.A.H.**, Meijer, O.C. and Burbach, J.P.H. The effect of lesions of neural inputs to hypothalamic magnocellular neurons on the expression of vasopressin and oxytocin genes. *Neurosci. Res. Comm.* (1993) 13: 115-123.

**Adan, R.A.H.**, Cox, J.J., Van Kats, J.P. and Burbach, J.P.H. Thyroid hormone regulates the oxytocin gene. *J. Biol. Chem* (1992) 267: 3771-3777.

Pardy, K., **Adan, R.A.H.**, Carter, D., Seah, V., Burbach, J.P.H. and Murphy, D. The identification of a cis-acting element involved in cyclic 3',5'-adenosine monophosphate regulation of bovine vasopressin gene expression. *J. Biol. Chem.* (1992) 267: 21746-21752.

**Adan, R.A.H.**, Cox, J.J., Beischlag, T.V. and Burbach, J.P.H. A composite hormone response element mediates the transactivation of the rat oxytocin gene by different classes of nuclear hormone receptors. *Mol. Endocrinol.* (1992) 7: 47-57.

**Adan R.A.H.** and Burbach J.P.H. Regulation of vasopressin an oxytocin gene expression by estrogen and thyroid hormones *Progress Brain Res.* (1992) 92: 127-136.

Burbach, J.P.H., **Adan, R.A.H.** and de Bree, F.M. Regulation of oxytocin gene expression and forms of oxytocin in the brain *Ann. N.Y Acad. of Sci.* (1992) 652: 1-13.

**Adan, R.A.H.**, Walther, N., Cox, J.J., Ivell, R. and Burbach, J.P.H. Comparison of the estrogen responsiveness of the rat and bovine oxytocin gene promoters. *Biochem. Biophys. Res. Comm.* (1991) 75: 117-122.

Burbach, J.P.H., **Adan, R.A.H.**, van Tol, H.H.M., Verbeeck, M.A.E., Axelson, J.F., van Leeuwen, F.W., Beekman, J.M. and AB, G. Regulation of the rat oxytocin gene by estradiol *J. of Neuroendocrinology* (1991) 2: 633-639.

Verbeeck, M.A.E., **Adan, R.A.H.** and Burbach, J.P.H. Vasopressin gene expression is regulated by cAMP in homologous and heterologous expression systems *FEBS letters* (1990) 272: 89-93.

## ***Patents***

European patents no 96203567.1 "Melanocortins" by Adan R.A.H., Burbach J.P.H and Gispen W.H and 9808229.0 "Melanocortin receptor ligands" by Adan R.A.H. and Gispen W.H