

Ph.D. student ONWAR Course Molecular Neurobiology and Genetics

Monday 23 June – Friday 27 June 2025

Organizers:

Guus Smit

Center for Neurogenomics and Cognitive Research, VU

Danielle Posthuma

Complex Genetics, VU

Frank Jacobs

Swammerdam Institute for Life Sciences, UvA

Evgenia Salta

Netherlands Institute for Neurosciences, NIN/KNAW

Graduate School Neurosciences
Amsterdam Rotterdam

List of speakers

Netherlands Institute for Neuroscience
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Aletta van den Bosch
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Priyanka Rao-Ruiz
Ruud Wijdeven
Rik van der Kant
Ruud Toonen
Rachel Brouwer
Vivi Heine
Frank Koopmans
Marijn Schipper
Bernardo Maciel
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Locations:

All lecture in the **Swammerdam Institute for Life Sciences** are at the Science Park in room C1.112. After entering the main entrance of the Science Park 904 building, take the wide stairs up to the 1st floor, and follow the signs to the C-wing. Look for signs reading ‘C1.112’

Lectures at the **VU University** are in the New University (NU) Building, rooms NU-5a27. This is opposite the W&N building. The NU building is also known as the OZW or “Opleidingsinstituut voor zorg en welzijn” building.

Lectures in the **Netherlands Institute for Neuroscience** are in the Colloquium Room at the top floor of the Institute at Meibergdreef 47, 1105BA, Amsterdam-Zuid Oost.

Program Ph.D. course molecular neurobiology and genetics

Coordinator: Frank Jacobs (UvA)

Monday 23 June 2025 - Science Park Building 904 room C1.112

09.00-09.10	Welcome and introductory remarks on the aim of the course	Frank Jacobs
The origin and evolution of the human genome; implications for neurological disorders		
09.10-10.00	Genomics of Human Brain Evolution	Frank Jacobs (UvA)
10.00-10.15	coffee	
10.15-11.00	Segmental duplications at the verge of evolutionary innovation and neurodevelopmental disorders	Frank Jacobs (UvA)
11:00 - 12.00	Keynote lecture: Looking at neurodevelopmental disorders through the lens of evolution: a role for the autolysosomal pathway	Elly Lewerissa (Radboud)
12.00-13.00	Lunch	
The genetics of neurological diseases		
13.00-14.00	Keynote lecture: Spinal muscular atrophy: from complex genetics to genetic therapies	Ewout Groen (UMCU)
14.00-14.45	Myelination in Pitt-Hopkins syndrome: <i>the effects of Tcf4 mutations on oligodendrogenesis</i>	Simone Mesman (UvA)
14:45-15:00	Tea	
15.00-15.45	Genetic repeat expansions in disease	Anke Dijkstra (UvA)
15.45-16.30	FOXO transcription factors in cortex development and neural stem cell maintenance	Marco Hoekman (UvA)

Coordinator: Guus Smit (VU)

Tuesday 24 June 2025 – NU Building room NU-5a27

Analysis of proteins – protein interactions and proteomics

09.00-10.00	Protein interactions: Yeast-two-hybrid system versus mass spectrometry	Guus Smit
10.00-11.00	Structural Biology: application in neurobiology	Bert Janssen
11.00-11.15	Coffee	
11.15-12.00	Analyzing the proteome of synaptic subpopulations	Priyanka Rao Ruiz
12.00-12.45	Lunch	
12.45-13.30	The SynGO database: use cases	Frank Koopmans

Live cellular imaging of tagged proteins

13.30-14.15	Live imaging of GFP-tagged proteins in neurons	Ruud Toonen
14.15-15.00	Super-resolution imaging of synapses using CRISPR/Cas9	Harold MacGillavry
15.00-15.15	Tea	

iPS cells and cellular screening technology (“Cellomics”)

15.15-16.00	iPS Center: A stem cell culture and phenotype screening facility at the VU/VUMC	Vivi Heine
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Keynote lecture

16.00-17.00	CRISPR, drug and drug target identification for CNS disorders	Ruud Wijdeven
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Coordinator: Guus Smit / Danielle Posthuma (VU)

Wednesday 25 June 2025 – NU Building room NU-5a27

High-throughput gene expression analysis

09.00 -10.00	Genome Wide Association studies (GWAS) to decipher complex brain disorders	Rachel Brouwer
10.00 -11.00	Single cell sequencing approaches	Ahmed Mafouz
11.00-11.30	Coffee	
11.30-12.30	Practical: Allen Brain Atlas – Handling Big data sets	Boudewijn Lelieveld
12.30-13.30	Lunch	

Complex Trait genetics

13.30 – 14.15	Molecular tools for gene discovery and interpretation in complex trait genetics	Marijn Schipper
14.15 – 15.00	Gene intervention in dissecting memory circuits	Michel van den Oever
15.00-15.15	Coffee	
15.15-16.00	A brief history of Alzheimer's disease GWAS	Douglas Wightman
16.00-17.00	The genetic landscape of heterogeneity in human functional brain connectivity	Bernardo Maciel

Coordinator: Evgenia Salta (NIN)

Thursday 26 June 2025 – Netherlands Institute for Neuroscience

Colloquium room

Gene manipulation and gene therapy

09.00-09.15	Introduction	Evgenia Salta
09.15 – 10.00	Gene therapy in large animal models	Bas Blits
10.00 – 11.00	Molecular drivers of demyelinating neurodegenerative diseases	Mohit Dubey
11.00 – 11.30	Coffee/Tea	
11.30 – 12.30	Targeted molecular approaches for Parkinson's disease: from bench to bedside	Lars van der Heide
12.30 - 13.30	Lunch	
13.30 – 14.30	Targeting Alzheimer's disease – a molecular approach	Rik van der Kant
14.30 - 14.45	Coffee/Tea	

Big data collections of the human brain

14.45 – 15.30	The Netherlands Brain bank: a resource of well-documented human brain tissue	Inge Huitinga
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Keynote lecture

15.30-16.30 (online)	The Netherlands Neurogenomics Database	Inge Holtman
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Coordinator: Evgenia Salta (NIN)

Friday 27 June 2025 – Netherlands Institute for Neuroscience

Colloquium room

Single-cell omics approaches to brain function and disease

09.00-09.45	Single-cell transcriptomic pipelines: Where the wet lab meets big data	Dilara Ayyildiz
09:45 – 10:30	Single-cell transcriptomics approaches to human adult hippocampal neurogenesis in healthy and Alzheimer’s brain	Evgenia Salta
10:30 – 11:00	Coffee/Tea	
11:00 – 12:00	Omics technologies to study brain development and disease	Onur Basak
12:00 – 13:00	Lunch	
13:00 – 13.45	Molecular mechanisms of Multiple Sclerosis	Aletta van den Bosch
13:45 – 14:30	Using single cell and spatial transcriptomic approaches to study neurodegenerative diseases	Janssen Kotah
14.30 – 15.00	Coffee/Tea	

Keynote lecture:

15:00 - 16.00	Seeing is Sequencing: Linking Dynamic Phenotypes to Sequencing Profiles	Miao-Ping Chien
16.00-17:00	End of Course - DRINKS	