



Research project
investigating
the underlying
mechanisms of co-existing
neurodevelopmental
conditions and epilepsy

CANDY



Comorbid Analysis of Neurodevelopmental Disorders and Epilepsy

www.candy-project.eu



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WHY

CO-EXISTING NEURODEVELOPMENTAL CONDITIONS?



In Europe, 10-15% of children and adults or 50 to 75 million individuals are affected by neurodevelopmental conditions, such as **autism**, **attention-deficit hyperactivity disorder (ADHD)**, **intellectual disability (ID)**, motor problems and language disorders.

It is not hard to imagine that one of these conditions alone can have a serious impact on a person's life. What makes the situation even worse is the fact that several of these conditions often **co-exist** and, on top of that, go along with somatic illnesses, such as **epilepsy**. This significantly affects both life expectancy and quality of life and there are no effective treatments to date.

In the CANDY project, we investigate the **biological links** between these neurodevelopmental conditions and co-existing somatic illnesses and how treatment and monitoring of affected persons can be improved.

Start	1 January 2020
End	31 December 2024
Duration	60 months
Funding	European Commission “Horizon 2020”
Budget	6 M€
Partners	16 from 7 countries
Coordinator	Radboudumc, NL



WHAT ARE YOU LOOKING AT IN CANDY?



Since we are able to map the entire human genome today, we have made tremendous progress in understanding the genetic basis of many diseases. However, there is almost never a one-to-one link between a single gene and a single illness.

Recent evidence shows that certain **genetic variants**, which increase the risk for neurodevelopmental conditions, are shared between these conditions and affect the **same biological pathways**. The symptom profile and severity are likely also moderated by **environmental factors** acting at different time points (**critical periods**). Therefore, we are also investigating the role of **early maternal immune activation** and the **gut microbiome**. The interaction between host genetics and the gut microbiome could clarify why carrying certain risk-conferring genetic variants only explains a part of the different **symptom spectra** that we observe in neurodevelopmental conditions.



“By looking at the underlying mechanisms, it is our aim to understand better the cause of co-existing neurodevelopmental conditions and epilepsy and to ultimately find new strategies for prevention and treatment for affected people.”

Prof. Jan Buitelaar, Coordinator
Radboudumc

WHAT IS THE BENEFIT OF CANDY?



Our overall goal is to improve the understanding of the crosstalk between genetics, immune activation/inflammation, and the microbiome, thereby providing a compelling novel conceptual framework to:

Elucidate the *causal mechanisms* that underlie autism, ADHD, ID and epilepsy

Deliver *novel biomarkers* to guide early diagnosis, stratification and treatment monitoring

Develop *new strategies for prevention* and *treatment* of autism, ADHD, ID, and epilepsy

Open-up *new avenues for research* in autism, ADHD, ID, and epilepsy

This will ultimately benefit people with neurodevelopmental conditions by improving their long-term outcome and lower their burden.

CONSORTIUM

THE CANDY PARTNERS

For the first time, experts from the fields of **autism, ADHD, ID** and **epilepsy** are joining forces in the **CANDY consortium**.

Academic partners

- Radboudumc, NL (Coordinator)
- King's College London, UK
- Institut Pasteur, FR
- Universität Basel, CH
- Rijksuniversiteit Groningen, NL
- Universiteit Gent, BE
- Karolinska Institutet, SE
- Assistance Publique – Hôpitaux de Paris, FR
- INSERM, FR
- Universität Ulm, DE
- Commissariat à l'Énergie Atomique et aux Énergies Alternatives, FR
- Birkbeck College – University of London, UK

Patient organisations

- ADD information services, UK
- Autism Europe, BE

SME & Industry

- Noldus Information Technology BV, NL (SME)
- ARTTIC, FR (Project management)

Radboudumc
Radboud University Medical Centre



INSTITUT PASTEUR



Ghent University

Karolinska Institutet

ASSISTANCE PUBLIQUE HÔPITAUX DE PARIS

Inserm
Institut National de Santé Publique et de Médecine Préventive

Universität Ulm



Birkbeck
University of London



Autism Europe

ADDISS
Autism Diagnostic and Information Services

Noldus
Information Technology

ARTTIC



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