

Welcome to the Dopamine Lab!

The Leiden Dopamine Lab explores the relations between dopamine, a very important neurotransmitter of the brain, and cognitive control the way we control our thoughts and goal directed behavior. A special focus of the lab is to explore how exactly dopaminergic supply affects control functions.

Several factors like drugs, such as cocaine, sexual hormones, such as estrogen, stress and particular genetic polymorphisms are known to target dopamine. Using theoretically motivated cognitive tasks, including different techniques as reaction time (RT), event-related potential (ERP) and functional magnetic resonance imaging (fMRI), we search for convergent evidence for the role of dopamine in cognitive control.

Notably, in Europe the recreational use of cocaine already took the place of ecstasy as second preferred recreational drug after cannabis. Whereas a "chronic" user, as described in the existing literature, consumes cocaine on a very regular base (1 gram daily), so far, only studies from our Dopamine Lab have systematically focused on cognitive impairments among this "upcoming type" of recreational users, who do not meet the criteria for abuse or dependence, but take cocaine (preferred by snorting route), on a monthly frequency (1 to 4 gram). Given that cocaine may affect judgment and decision-making (especially in term of high-risk sexual behaviour), it will be a matter of time that this topic will become a public health issue, as is currently also the case for the recreational use of ecstasy.

The Dopamine lab participates in the Leiden Institute for Brain and Cognition (LIBC), which is an interfaculty center for interdisciplinary research on brain and cognition, supported by the Leiden University Medical Center (LUMC) and the Faculties of Social & Behavioral Sciences, Arts, and Mathematics & Natural Sciences, Leiden University (www.libc-leiden.nl).

Specific projects

- Cocaine and cognitive control: How does the recreational use of cocaine affect how we control our thoughts and actions?
- Stress and cognitive control: How does stress affect how we control our thoughts and actions?
- Estrogen and cognitive control: How does estrogen affect how we control our thoughts and actions?
- Gene and cognitive control: How do genes related to dopaminergic activity affect how we control our thoughts and actions?

Principal investigator: Lorenza S. Colzato



Research staff:



Elize Vlainic



Maud Grol

Current undergraduates students:

Gitta Hertsig,
Joost Bordonis,
Doris van Dijk,
Janna Hekman,
Nina van Lier,
Kiki Manse,
Marieke van der Meer,
Martine van Nierop,
Alain Boersen,
Stephanie Greve,
SL Maaskant,
Raul Putman,
Laura Rus