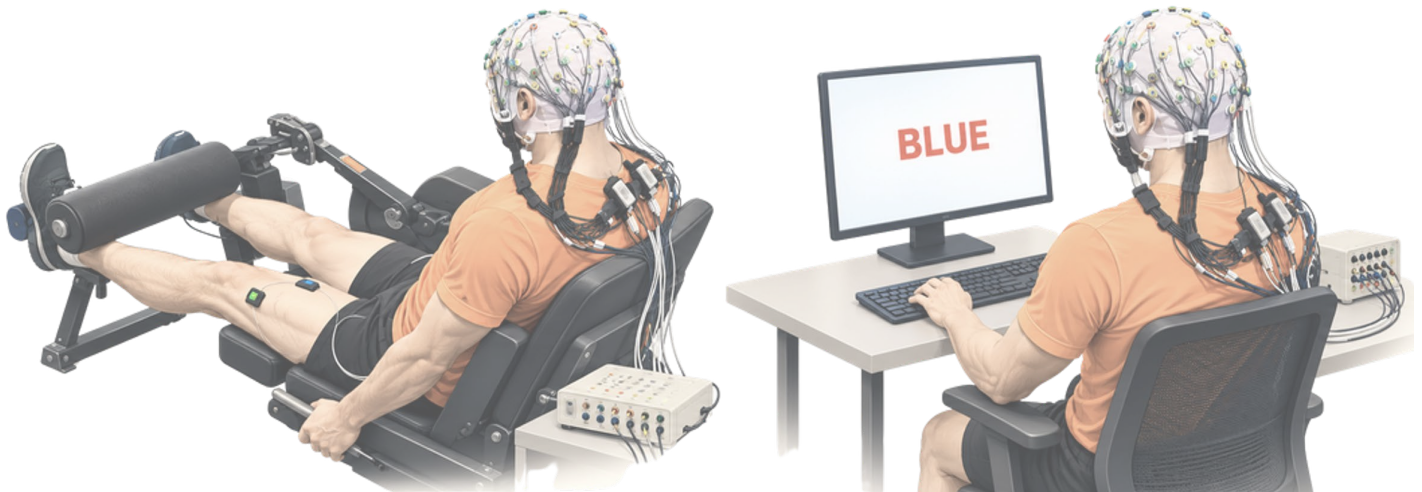




THE NEUROCHEMISTRY OF FATIGUE: FROM BEHAVIOR TO BRAIN DYNAMICS

Y. LAURISA ARENALES ARAUZ

PUBLIC PHD DEFENCE FOR THE DEGREE OF
DOCTOR IN MOVEMENT AND SPORT SCIENCES

FRIDAY, NOVEMBER 13TH 2026 AT 18:00
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ABSTRACT OF THE RESEARCH

Fatigue influences how we think, perform, and feel, yet we still do not fully understand what regulates these changes. Dopamine and noradrenaline have both been implicated in fatigue-related processes, but their contribution across different aspects of the fatigue response remains unclear.

In my PhD, I explored this through one study protocol and two independent experimental studies. Using pharmacological manipulation, I examined how changes in catecholaminergic neurotransmission affect subjective fatigue, cognitive and physical performance, physiological responses, and brain activity.

Rather than focusing on one single measure, I studied fatigue from several angles and across both mental and physical demands. This made it possible to examine whether catecholaminergic modulation produces similar effects across fatigue domains, or whether its influence depends on the specific response being studied. Such an approach is important because changes in how fatigued we feel do not necessarily parallel changes in performance, physiology, or brain activity.

The findings reveal a selective and context-dependent role of catecholamines in fatigue, providing a more precise understanding of where catecholaminergic mechanisms matter in the fatigue response.

CURRICULUM VITAE

My name is Laurisa Arenales Arauz, and I am from the Netherlands. I studied Human Movement Sciences at the University of Groningen, where I specialized in Healthy Ageing. During my PhD at Vrije Universiteit Brussel, I further developed my expertise in EEG through several international research stays and became involved in several collaborative projects within the research group. I also contributed to research on whole-body vibration and brain function in collaboration with the University of Groningen, and worked within the TBrainBoost project, which aims to strengthen the connection between scientific research and industry.

Alongside my research, I gained experience in teaching physiology practicals, working in our BLITS lab and supervising master's students. I am an enthusiastic and curious researcher who enjoys learning new methods, sharing knowledge, and taking on new challenges.

