

REVIEW

Of the *member* of the dissertation council for the dissertation of *Konstantin A. Demin* on the topic: "Neuroscience foundations of stress-induced affective pathogenesis in zebrafish and its translational relationship with affective pathogenesis in rats and humans", submitted for the degree of *doctor of biological sciences* in a scientific specialty 1.5.24. Neurobiology

The candidate's dissertation is of very significant quality and constitutes a set of original contributions to neuroscience with relevant translational potential. Importantly, the studies conducted by the candidate and his supervisor and team members not only investigate relevant biological questions, such as neuropsychiatric disorders from a translational perspective, but also contribute with new and robust protocols that can be used by the scientific community in subsequent studies.

The thesis includes five original articles published in relevant scientific journals, two of which have Konstantin as the first author. Also, they do not represent all the scientific contributions of the candidate in the period, which significantly exceed this number and include first authored papers in 2022. This also demonstrates the relevance and quality of the overall studies conducted, as all of them have been peer reviewed and endorsed for publication. The studies are also complementary regarding their content and biological questions addressed, showing cohesion. Here I will focus my considerations on the two studies that the candidate is the first author.

In both studies methodological execution and data analysis show scientific rigor and the interpretation of data is properly and carefully performed. Also, the mentioning of conceptual and methodological limitations confirms the quality of the studies, as it is a good practice recommendation and a reproducibility initiative. In that sense, I suggest the consideration of incorporating ARRIVE guidelines' (Animal Research: Reporting of *In Vivo* Experiments) description in subsequent experimental studies.

The study entitled *Understanding neurobehavioral effects of acute and chronic stress in zebrafish* (doi: 10.1080/10253890.2020.1724948), published in the journal *Stress* in 2021 constitutes a quality contribution to the field. The study includes a broad analysis on the topic, demonstrating a great analytic capacity. It also organizes selected studies according to their contribution, which will certainly support and influence subsequent efforts from scientist from different areas interested in the topics covered.

In the manuscript published in *Scientific Reports* and intitled *Modulation of behavioral and neurochemical responses of adult zebrafish by fluoxetine, eicosapentaenoic acid and lipopolysaccharide in the prolonged chronic unpredictable stress model* (doi: 10.1038/s41598-021-92422-6), relevant and current questions about the behavioral and neurochemical effects of stress and substances associated with inflammatory and anti-inflammatory processes are addressed. This is a very interesting approach as it is currently clear that neuropsychiatric disorders, as is the brain, are not isolated from other physiological processes and may be significantly influenced. Also, stress is a common pathogenetic factor for different disorders. For this, they developed a prolonged chronic stress protocol that lasted 11 weeks and extended previous efforts to characterize the biological effects and pharmacological interactions. This is a positive innovation as it mostly closely resembles human conditions and allows for a more realistic analysis of the effects of pharmacological agents whose effects are not immediate. The

experimental design combining different neuroprotective and inflammatory agents increases the contribution of their study to translational analysis.

Dissertation of *Konstantin A. Demin* on the topic: "Neuroscience foundations of stress-induced affective pathogenesis in zebrafish and its translational relationship with affective pathogenesis in rats and humans " *meets* the basic requirements established by Order No.11181/1 dd. 19.11.2021 "On the procedure for awarding academic degrees at St. Petersburg State University". The applicant *Konstantin A. Demin* *deserves* to be awarded the academic degree of *doctor* of biological sciences in a scientific speciality 1.5.24. Neurobiology. No violations of paragraphs 9 and 11 of the specified Order have been detected.

Member of the Dissertation Council

A handwritten signature in black ink, reading "Monica Ryff Moreira Roca Vianna". The signature is written in a cursive, flowing style.

Prof. Monica Ryff Moreira Roca Vianna, Ph.D.

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Head of the Office for the Internationalization of Graduate Programs

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