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PhD in Medical Sciences  
2018-2019

INVITATION to the Public defence of

**Laura Légat**

To obtain the academic degree of '**DOCTOR OF MEDICAL SCIENCES**'

**The role of brain AT<sub>1</sub> and AT<sub>2</sub> receptors in the central regulation of blood pressure: interaction with glutamate, GABA and NO**

**Wednesday, 11 September 2019 at 5 p.m.**

In Auditorium **Piet Brouwer**

Faculty of Medicine and Pharmacy, Laarbeeklaan 103, 1090 Brussels

How to reach the campus Jette:

<http://www.vub.ac.be/english/infoabout/campuses>

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## Summary of the dissertation

Arterial hypertension, one of the most common chronic diseases worldwide, is characterized by a high morbidity and mortality rate because it contributes to the development of ischemic heart disease, heart failure, renal failure and cerebrovascular events. In many patients with essential hypertension, the blood pressure is not well-controlled. Targeting the chronic dysregulation of the central control of blood pressure seems important, as hypertension is generally associated with dysregulation of the sympathetic outflow.

The nucleus tractus solitarius (NTS), the paraventricular nucleus (PVN), and the rostral ventrolateral medulla (RVLM) are the three most targeted regions in studies of the central cardiovascular control. There is evidence that glutamate, gamma-aminobutyric acid (GABA), and nitric oxide (NO) interact within these brain regions to modulate the central regulation of blood pressure. The most important hormonal system in the regulation of blood pressure is the renin-angiotensin system (RAS). Angiotensin II (Ang II), as important effector in the RAS, mediates its actions mainly through the angiotensin II type 1 receptor (AT<sub>1</sub>R), but also through the angiotensin II type 2 receptor (AT<sub>2</sub>R), which counterbalances the unfavorable AT<sub>1</sub>R mediated effects. The focus of our work has been to investigate how different actors of the RAS interact with their receptors and with amino acids (glutamate and GABA in particular) and how they are involved in blood pressure regulation in the brain.

Taken together, the doctoral thesis enlarges our understanding of the contribution of the RAS in the central blood pressure regulation, more particularly the contribution of the AT<sub>1</sub>R and AT<sub>2</sub>R and their interaction with GABA and the NO-pathway in different brain regions involved in blood pressure regulation.

## Curriculum Vitae

Laura Légat was born on April 10<sup>th</sup> 1992 and started as Biomedical Sciences student at the Vrije Universiteit Brussel in 2009. She graduated as master in Biomedical Sciences in 2015, magna cum laude, and continued her career as doctoral researcher in Medical Sciences at the Center for Neurosciences under the supervision of Prof. Dr. Ilse Smolders and Prof. Dr. Alain G. Dupont (Laboratory of Pharmaceutical Chemistry, Drug Analysis and Drug Information, VUB). Her research focused on the role of brain AT<sub>1</sub> and AT<sub>2</sub> receptors in the central regulation of blood pressure and the interaction of these receptors with glutamate, GABA and nitric oxide. Laura is author of 5 peer-reviewed papers, among 4 as first author and 1 as shared first author. Her work was presented at various national and international conferences.