

Sofie Brouwers  
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Vilvoorde, September 7th 2013

**Motivation letter for a grant from 'Medische Stichting Mathilde Horlait-Dapsens'**

Dear Sir or Madam,

My passion for medical sciences is as old as my first steps in kindergarten. I have been motivated and focused since the beginning of my medical studies - as in Belgium an entrance exam needs to be passed - throughout my studies and getting closer to my diploma. Piece by piece I have gathered insight into the enormous vast and fascinating field the collective term 'Medicine' embraces and have tried to filter the most attractive parts for me: Internal Medicine - still a broad piece - and its scientific foundations. Keeping up with the scientific literature and contributing to the swiftly published new knowledge in fundamental medical research appeals to me. My preference for the cardiovascular system and the intriguing impact of the central nervous system in human health and disease, combined with some unconventional critical ideas brought me towards my actual research field. Even though the high worldwide prevalence of hypertension keeps on rising, the pathophysiologic explanation remains poor. My first intensive and close encounter with the scientific medical literature resulted in a review, written together with my advisor and published in my 6<sup>th</sup> year of medicine (*Dupont and Brouwers, J Hypertens 2010 28:1599-610; impact factor 4,988*). In the meantime, I also spent many spare hours in the laboratory, observing daily life and activities carefully, and learning how to prepare, perform and assess experiments in hypertension research. Obtaining a PhD degree has been an important and inevitable wish for my long-term prospects. I am aiming for an academic career, combining medical practice with scientific research and teaching. A profound interest and drive to contribute to medical scientific discoveries with the goal of always improving patient care make me a motivated candidate for fundamental research. To be able to work as researcher beside the clinical aspect at the start of my specialization in internal medicine, I applied and obtained a 'Research Foundation - Flanders (FWO)' grant for my research project focused on the central regulation of blood pressure. For the short-term regulation of the blood pressure, the essential role of the nervous system has been established,

while its crucial role in the long term control of blood pressure has not yet been fully unravelled. An important region in the brain, named the 'pressor area', seems to gather input from several integrative areas in the brain and processes this information into an excitatory signal projected towards the spinal cord. Classical neurotransmitters as well as specific angiotensin peptides are involved in the balance resulting from these various interactions. The project aims to increase the understanding of the central regulation of blood pressure by measuring these different neurotransmitters and peptides in the brain as well as the overall blood pressure and activity of the nervous system. I left for a research training at Professor Wainford's lab at Boston University in March 2013 with the intention to learn as much techniques as possible and be able to continue my work in our lab in Belgium. This is the only research unit equipped with the specific and complex techniques for the animal experiments warranted in my project. The expertise of Professor Wainford and his group guarantees excellent conditions and discussions to make a stay in his laboratory successful. I rapidly integrated into this well-organised, excellently equipped team and I realised that this efficiency for carrying out the 'chronic part' of my research plan could not easily be reproduced back home, and certainly not within the timeframe left. Therefore I am eager to return and perform my chronic experiments in Boston, which will represent an important part of the research for my PhD thesis and which will certainly also result in peer-reviewed publications.

This stay abroad will also contribute to my scientific development/career providing me with a broader view and making it possible to further strengthen my international collaborations. I am confident that it will indeed open new opportunities for further collaboration between our Brussels research group and the group in Boston. We have a common research interest in investigating the role of the brain in cardiovascular and renal (patho)physiology and our know-how, available research technology and methodology are really complementary.

Yours faithfully,

Sofie Brouwers, MD  
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RE: Beurs van de Medische Stichting Mathilde Horlait-Dapsens Sofie Brouwers - Recommendation

September 8, 2013

Dear Committee Members,

Sofie Brouwers M.D. is an outstanding M.D. who received the Nedeljkovitch prize for being the 'best student in medical sciences of her generation' at the Faculty of Medicine and Pharmacy of the Vrije Universiteit Brussel. Upon graduation Ms. Brouwers had the best results of the Faculty of Medicine. Her grades place her in the top 5% of medical students who have graduated in the last 5 years reflecting her outstanding achievements as a medical student and exceptional future potential as a clinician. Upon completion her Masters in Medicine she has elected to pursue a specialization in cardiovascular internal medicine. Indicating her drive, commitment and outstanding communication skills she acted as the student representative of her generation and represented her fellow students in both Faculty Council and the Medicine Teaching Council.

Dr. Brouwers pursuit of a Ph.D. and a dual career as a physician and basic scientist began immediately following her completion of the Masters 1 exam – when she contacted Professor Dupont to discuss her ambition to specialize in pharmacology and cardiovascular medicine (hypertension in particular) and to perform research related to these topics with the aim to obtain a Ph.D. As preparation for her Ph.D. Sofie completed a review on the central regulation of blood pressure (in particular on the role of angiotensin peptides). This literature review was published in the Journal of Hypertension (Dupont and Brouwers, 2010 28:1599-610; impact factor 4.988), and was commented as “an excellent review” by the referees and the editor. This review formed the basis of the studies that Dr. Brouwers has elected to pursue for her Ph.D. project.

Dr. Brouwers began her Ph.D. program in the Experimental Pharmacology Research Group, headed by Prof. Michotte, with Prof. Smolders and Dupont as her co-promoters. She rapidly integrated into the responsibilities and duties required of a research student and has gained scientific insight and the highly specialized skills required to perform surgical procedures on rodents and generate in-vivo experimental data. She has conducted a series of technically difficult experiments in anesthetized Wistar Kyoto (WKY) and spontaneously hypertensive rats (SHR) with IV administration of different compounds to examine their effects on blood pressure and renal blood flow. These studies have been published in Hypertension (top ranked Hypertension Journal) and demonstrated that AT<sub>2</sub> receptors are involved in the regulation of renal blood flow in SHR but not in WKY rats and that this AT<sub>2</sub> receptor mediated renal vasodilation is NO dependent.

Dr. Brouwers has been granted a research grant of the Flemish Research Council starting October 2011, indicating her high skills and potential as a research scientist and has been awarded multiple travel grants to present her research both nationally and internationally. I am confident that Sofie Brouwers will be able to successfully perform the experiments described in her project and obtain a PhD within 4 years, which will without doubt be the start of a successful research career as post doc afterwards. Further indicating the esteem in which she is held in Hypertension circles she has been elected a member of the International Society of Hypertension New Investigator Committee.

In conclusion I believe Dr. Brouwers' clinical skills and unique basic science cutting edge investigations into the actions of the AT<sub>2</sub> receptor in-vivo and in the pathophysiology of hypertension are of high clinical and public health significance owing to the worldwide prevalence of hypertension and the key role of the angiotensin system in the pathophysiology of this disease. It is my belief that she is the ideal candidate for a 'Beurs van de Medische Stichting Mathilde Horlait-Dapsens' award that will significantly enhance her PhD training and I give her application my highest level of support.

Yours sincerely,

A handwritten signature in black ink, appearing to read 'R. Wainford', written in a cursive style.

Richard D Wainford