



The VIB Department of  
Molecular Genetics at the University of Antwerp is  
looking for a PhD student



## PhD project: 'Genetic susceptibility to Alzheimer's disease'

### Project description:

Alzheimer's disease (AD) is a common and very disabling dementia disorder that mostly occurs in elderly people, affecting memory, behavior and other areas of cognition such as communicative skills. No cure exists; current treatments are only capable of attenuating symptoms and halting progress for a few years, but patients invariably progress to a severe state of dependency and ultimately death. Because of changing demographics due to increased life expectancy, the prevalence of AD is increasing rapidly. In the absence of a cure or preventive strategy, the number of dementia patients worldwide is projected to increase from 35.6 million in 2010 to 115.4 million in 2050. Molecular genetic analysis of AD plays an important role in elucidating key pathomechanisms; knowledge which in turn can be used to develop diagnostic assays, treatments and preventive strategies. Several highly pathogenic mutations and more common genetic risk factors are known to be involved in the pathogenesis of AD, but together these only explain a fraction of the occurrence of the disease.

In this project, we will explore other genetic susceptibility factors for AD. We will not only focus on the traditional common single nucleotide polymorphisms in (genome-wide) genetic association analyses, but also on rare variants of intermediate risk effect discovered in high throughput sequencing experiments, and on copy number variations, both common and rare. Evidence increases that these types of genetic variation can contribute substantially to the susceptibility of common diseases, but their role in susceptibility to AD is still largely unexplored. A combination of techniques from molecular genetics and genetic epidemiology will be used on a large, well-documented homogeneous study population for which biomaterials (such as DNA, lymphoblast cell lines, serum, plasma, brain tissue) and extensive clinical documentation are available, allowing genotype-phenotype correlation analyses.

A specific focus of this project will be to further unravel the genetic etiology of the early-onset form of AD, that has its onset already in midlife and is severely disruptive for patients and their families. Early-onset AD has a strong genetic component. For mapping of novel monogenic causes, rare variants of intermediate risk and disease modifiers, family-based studies will be used. In population-based studies, we will search for recessive mutations, and rare and common risk factors.

The VIB Department of Molecular Genetics, and particularly the Neurodegenerative Brain Diseases Group, has a long-standing expertise in the molecular genetics of AD, and has contributed significantly to the current knowledge of the genetic etiology of AD. The department has a centralized genetic service facility that allows high throughput processing of the samples and data. DNA extraction, establishment of lymphoblast cell lines and computational analyses are also centralized.

**Context:**

The VIB Department of Molecular Genetics is one of 8 research departments of VIB (<http://www.vib.be/VIB/EN/>). With near 100 researchers working in 4 research groups, the department aims to understand the complex nature of neurological and psychiatric human diseases (<http://www.molgen.ua.ac.be/>). The department disposes over the expertise of centralized service facilities like the Genetic Service Facility and the Diagnostic Service Facility, as well as central units with expert knowledge in functional genomics, technology development and bio-informatics.

The VIB Department of Molecular Genetics is located at the University of Antwerp (<http://www.ua.ac.be/>), and is affiliated with the Institute Born-Bunge, a research institute with a track record in clinical neurological and pathological research into CNS and PNS diseases ([http://www.bornbunge.be/Home/index\\_nl.shtml](http://www.bornbunge.be/Home/index_nl.shtml)), and to the faculty department of Biomedical Sciences of the Faculty of Pharmaceutical, Biomedical and Veterinarian Sciences.

**Candidate profile:**

- Motivated students of all nationalities with a strong commitment to basic and/or clinical research.
- Holder of a MSc in medical or biomedical sciences, biochemistry, biotechnology or biology.
- Fluent in English (spoken and written language).
- Any experience in genetics, genomics or molecular cell biology is an advantage.
- The candidate should have well-developed social skills directed to working in a team.

**Application:**

If you are interested in this position, mail a letter of interest, curriculum vitae (including a list of publications) and the names of 2-3 reference persons to [phd@molgen.vib-ua.be](mailto:phd@molgen.vib-ua.be).