Press release – Science

Antwerp, Leuven, 22 June 2009

Fruit fly steps in to fight human disease

Antwerp, Leuven – VIB scientists have successfully introduced genes coding for a variant of the Charcot-Marie-Tooth (CMT) disease, into fruit flies. CMT is one of the most common hereditary disorders of the peripheral nervous system. VIB research – directed by Albena Jordanova, Patrick Callaerts and Vincent Timmerman - shows that the flies recapitulate several symptoms of the human disease.

"By putting mutant genes from human patients into fruit flies, we've created the first ever fly model for this kind of neuromuscular disease," says Albena Jordanova. "Now we have the opportunity to unravel the molecular mechanism behind Charcot-Marie-Tooth, as well as to start looking for substances with therapeutic value."

The breakthrough is the result of collaboration between VIB researchers working at the University of Antwerp and the Katholieke Universiteit Leuven, and appears in the Proceedings of the National Academy of Sciences (PNAS).

Charcot-Marie-Tooth is a hereditary disorder of the peripheral nervous system that affects 1 in 2,500 people worldwide. Patients suffer from progressive motor impairment, muscle wasting and weakness, sensory loss, and foot deformities. Affecting children and adults, the disease often starts with minor symptoms, gradually worsening over time. Presently CMT cannot be cured or prevented.

New chapter for an old gene

In previous research **Albena Jordanova** and **Vincent Timmerman** (VIB, University of Antwerp) discovered that CMT patients in families in Belgium, Bulgaria and the US showed three specific changes in one of the most ubiquitous genes in life: the YARS gene. YARS is responsible for the production of one of the oldest enzymes in the history of life (tyrosyl-tRNA synthetase), which is vital for the production of proteins. This was an entirely unexpected breakthrough. YARS had been considered a closed chapter in the biology textbooks. No one had suspected the relationship with specific variants of CMT until the revelation by Jordanova and her colleagues. These VIB findings open up an entirely new field of research.

Fruit flies with CMT symptoms

The VIB researchers at the University of Antwerp, in collaboration with **Patrick Callaerts** (VIB, K.U.Leuven) introduced four variants of the YARS gene into fruit flies. The normal variant, showed no difference in ordinary fruit flies. However, fruit flies with the mutant YARS genes, showed clear symptoms of CMT such as a reduced capacity to move, decreased functioning of the nerve cells and degeneration of the nerve endings.

Questions
Given that this research can raise a lot of questions for patients, we ask you to please refer questions in your report or article to the email address that VIB makes available for this purpose: patienteninfo@vib.be. Everyone can submit questions concerning this and other medically-oriented research directly to VIB via this address.

Relevant scientific publication
This research appears in the authoritative journal *Proceedings of the National Academy of Sciences* (Erik Storkebaum *et al.*, Dominant mutations in the tyrosyl-tRNA synthetase gene recapitulate in Drosophila features of human Charcot-Marie-Tooth neuropathy).

Funding
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Mention both VIB and the university
When reporting this research, please always mention VIB as well as the university concerned.

Info for the editor
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VIB
VIB, the Flanders Institute for Biotechnology, is a non-profit research institute in the life sciences. Some 1100 scientists and technicians conduct strategic basic research on the molecular mechanisms that control the functioning of the human body, plants, and micro-organisms. Through a close partnership with four Flemish universities – Ghent University, the Katholieke Universiteit Leuven, the University of Antwerp, and the Vrije Universiteit Brussel – and a solid investment program, VIB unites the forces of 65 research groups in a single institute. Their research aims at fundamentally extending the frontiers of our knowledge. Through its technology transfer activities, VIB strives to convert the research results into products for the benefit of consumers and

patients. VIB also develops and distributes a broad range of scientifically substantiated information about all aspects of biotechnology. More info at: www.vib.be.

The University of Antwerp

The University of Antwerp is situated in the economic and cultural heart of Flanders. It is a medium-sized university, renowned for its high-quality education and internationally relevant research in a variety of fields. Today, over 11,000 students are enrolled at the University of Antwerp, making it the third largest university in Flanders. Of these students, over 1,200 are visiting from abroad. With its 7 faculties, 2,455 academic staff members, 23 Bachelor, and 88 Master and Master-after-Master programmes, the University of Antwerp offers training in a wide range of fields. Thanks to the relatively small class sizes and excellent tutoring structures, individual students are given every opportunity to develop their talents optimally. The University of Antwerp is committed to a strong research policy. Numerous researchers with the University have performed excellently in competitive, interuniversity selection procedures and now belong to authoritative international research teams. Over 3,000 academic publications are produced at the University every year. The University of Antwerp cooperates intensively with other domestic and foreign universities, research centres and institutions, which translates into numerous exchange programmes in both research and education. Finally, the private sector is an important partner of the University of Antwerp in areas of socially and / or economically relevant research.

K.U.Leuven

The University of Leuven is Belgium's largest university and one of the oldest universities in Europe, founded in 1425. It is a comprehensive university with 14 faculties, with a long tradition of high-quality interdisciplinary research and teaching. The University of Leuven has over 33,000 students (12 percent international) and over 17,000 staff members (8,600 in the various university departments and 8,700 at UZ Leuven, the university hospital). More info at: www.kuleuven.be.

For more information

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