

Prof. Gaël Deboeck is a professor at the Faculty of Human Movement Sciences of the Université libre de Bruxelles (ULB) and director of the Rehabilitation Sciences Research Unit (RRU).

The RRU is led by Prof. Gaël Deboeck, Prof. Giovanni-Paolo Belgrado and Prof. Joachim Van Cant that respectively develop research activities in cardiovascular and respiratory rehabilitation and exercise physiology, lymphatic disorders and lymphoedema management, and musculoskeletal rehabilitation and sports physiotherapy. The unit comprises around twenty-five researchers actively promoting evidence-based practice in physiotherapy. The RRU is also actively involved in development and cooperation through research projects in physiology and pedagogy conducted in several countries of the Global South including Vietnam, the Democratic Republic of Congo (DRC) and Burundi.

Professor Deboeck's main research focuses primarily on cardiovascular and respiratory rehabilitation, exercise physiology, functional testing, and the physiological adaptation to exercise. He has progressively developed recognized expertise in cardiopulmonary exercise testing (CPET), 6-minute walk test, cardiorespiratory monitoring, and rehabilitation-related functional assessment. His work aims to better understand how physiological systems respond to exercise in both healthy individuals and patients, with the objective of improving rehabilitation strategies, patient monitoring, and clinical decision-making in physiotherapy.



Prof. Gaël Deboeck, director of the Rehabilitation Sciences Research Unit (RRU). © RRU

A major part of his research particularly explores gas exchange analysis, cardio-vascular and respiratory responses to exercise, and the physiological interpretation of

rehabilitation-related assessments. Prof. Deboeck's research aims to bridge physiology, rehabilitation sciences, functional assessment and real-world clinical physiotherapy practice. The objective is to provide physiotherapists and medical doctors with clinically meaningful tools capable of improving patient assessment, guiding rehabilitation progression and individualizing exercise prescription. More broadly, his research contributes to strengthening evidence-based practice in physiotherapy by integrating physiological and social mechanisms as well as technological innovation.

In collaboration with the Faculty of Medicine at ULB (Laboratory of Physiology and Pharmacology – LAPP, Prof. Nicolas Bayens), Prof. Deboeck leads several ongoing projects dedicated to the development of innovative non-invasive physiological monitoring tools for optimizing exercise assessment and patient follow-up. A complementary line of research examines exercise-induced adaptations of the skeletal muscle microvascular network using imaging analyses of muscle biopsies. In collaboration with the HUB-Erasme Rehabilitation Centre (CRPP – Michel Lamotte, PhD), he investigates the physiological adaptations to exercise training in cardiac patients. Other collaboration with sociologist Nastasia Hamarat investigates the factors affecting patient adherence to cardiovascular rehabilitation. He also works, in collaboration with University of Kinshasa (Rehabilitation & Respiratory Medicine, Prof. Pierre Lofuta Olenga Vuvu) on the effects of the exposome and of the smoke pollution on cardiorespiratory systems of charcoal workers in the DRC.

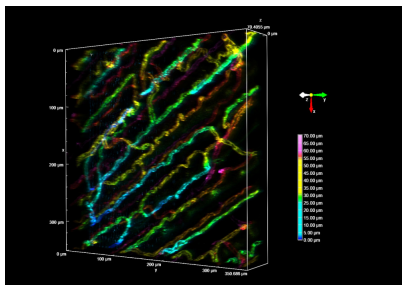


Cardiopulmonary exercise testing in RRU. © RRU - ULB

A major characteristic of Prof. Deboeck's research is its interdisciplinary and international dimension. He collaborates closely with Prof. Marco Vincenzi (Italy), Prof. Gabriel Dias Rodrigues (Brazil), Prof. Nicolas Bayens (ULB Faculty of Medicine), Dr. Patrick Feiereisen (Centre hospitalier de Luxembourg – CHL), Prof. Lofuta (DRC),

sociologist Nastasia Hamarat (ULB), and researchers from the TIPs laboratory at the Brussels Polytechnic School (Prof. Benoit Haut and Clément Rigaut). These collaborations aim to integrate physiological, technological, behavioral and sociological perspectives into rehabilitation research.

Future projects will concentrate on functional testing and its physiological implications especially in patient with chronic (cardiovascular or oncological) diseases in collaboration with the rehabilitation centre of HUB-Erasme (CRPP – Michel Lamotte, PhD). An additional research direction is the investigation of autonomic nervous system regulation of exercise adaptation and recovery processes.



Imaging of muscle microvascularisation. © RRU - ULB



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