

The Universitair Ziekenhuis (UZ) Brussel, located on the Brussels Health Campus in Jette, is a leading academic hospital affiliated with the Faculty of Medicine and Pharmacy of the [Vrije Universiteit Brussel \(VUB\)](#).

Founded in 1977, UZ Brussel today provides 721 hospital beds and employs nearly 5,000 staff, serving both Belgian and international patients. Each year it records more than 30,000 admissions, 445,000 consultations (excluding emergency visits), and 75,000 emergency patients. As part of its Spatial Plan, the hospital will expand its infrastructure by 67,000 m² of additional healthcare space by 2029.

The hospital and the Faculty of Medicine and Pharmacy are physically connected via a walkway and form a close research ecosystem. Clinicians and scientists collaborate in 23 active research groups, strengthening ties between patient care, teaching, and discovery.

Collaboration with VUB

“As a university hospital, we have a teaching mission and conduct scientific research,” explains Prof. Dr. Karine Breckpot, Director of Research at the Faculty of Medicine and Pharmacy and Chair of UMCOR (University Medical Center Research Council).

“Research is coordinated through the University Medical Center (UMC), structured into 10 thematic clusters. Research policy is shaped by the UMC Research Council and supported by UMC Research Management. Clinical studies benefit from the Clinical Trial Center and the Medical Ethics Committee.”



67,000 m² additional healthcare space by 2029. © Bart Moens & UZ Brussel

In the period 2020-2024, this collaboration produced 94 doctorates and a leading participation in six European research projects.

-**EURL-PH-DIPE**: European reference laboratory network for public health in the field of Diphtheria and Pertussis. UMC Coordinator: Dr. Eveline Van Honacker and Prof. Dr. Deborah De Geyter

-**EUnetCCC**: The European Comprehensive Cancer Centre Network. UMC Coordinator: Prof. Dr. Bart Neyns

-**ENACT**: Environmental Effect on Health Care and Wellbeing and Active Interventions. UMC Coordinator: Prof. Dr. Jean-François Argacha

-**ERIS** (European Research Institute on Simulation) consortium. UMC Coordinator: Prof. Dr. Carlo De Asmundis

-**ESCORT**: AI Enabled Healthcare Services during Cross-Border Medical Emergencies and Regular Patient Services. UMC Coordinator: Prof. Dr. Ives Hubloue

-**PREDICTOM**: Prediction of Alzheimer's Disease Using an AI Driven Screening Platform. UMC Coordinator: Prof. Dr. Sebastiaan Engelborghs.

Furthermore, researchers at UZ Brussel obtained two major support packages for heavy-duty research infrastructure from the [Flemish Research Foundation](#). One supports the [development of Flash radiation technology](#) for cancer treatment (led by Prof. Dr. Mark De Ridder and Prof. Dr. Thiery Gevaert), while the other funds the acquisition of a [7-tesla MRI scanner](#) (led by Prof. Dr. Johan De Mey).

Recognition for Researchers

In 2024, the Flemish Research Foundation (FWO) awarded four UZ Brussel researchers a Fundamental Clinical Mandate—half of all such mandates granted in Flanders that year. “In 2025, two more researchers received the award, confirming the hospital’s research excellence despite its relatively modest size compared with other Flemish medical-academic centres.

Pancreas and Liver Cancer

Prof. Dr. Nouredin Messaoudi, [hepatobiliary](#) surgeon, focuses on pancreatic and liver cancers, which are notoriously difficult to treat when diagnosed late. His research integrates artificial intelligence (AI) to analyse tumour subtypes and predict behaviour, with the goal of tailoring more precise, personalized treatments.

Chronic Pain Relief

Prof. Dr. Maarten Moens, neurosurgeon, investigates chronic pain management for patients unresponsive to standard therapies. His project **Needy** explores spinal cord stimulation (SCS) —delivering electrical impulses to block pain signals. He specifically targets chemotherapy-induced neuropathic pain, studying both optimal stimulation sites and objective outcome measures.

Immunotherapy for Skin Diseases

Prof. Dr. Jan Gutermuth, Head of Dermatology, examines the role of the immune system in eczema, skin cancer, and other dermatological conditions. His work explores how immunotherapies can be harnessed or modulated to treat complex skin complexions, potentially leading to breakthroughs where conventional therapies often are insufficient.

Multiple Sclerosis (MS)

Prof. Dr. Ir. Guy Nagels, Deputy Head of Neurology, continues his FWO mandate renewal with research on MS —a chronic central nervous system disease. He studies the impact of MS on brain function, particularly cognitive impairments such as memory loss and concentration difficulties. Collaborating with engineers and psychologists, he develops innovative solutions to improve daily functioning and quality of life for MS patients.

Blood Cancer

Dr. Sylvia Faict, who holds one of the two awarded FWO Fundamental Clinical Mandates in 2025, investigates multiple myeloma, the second most common blood cancer. She studies the role of microbiome-derived extracellular vesicles (BEVs) in immune modulation and tumour growth. By mapping BEVs in preclinical and human models, her research seeks biomarkers and new therapeutic targets.

Stem Cell Therapy for Diabetic Children

Prof. Dr. Willem Staels, paediatric endocrinologist, was previously granted an award and now sees it renewed. He focuses on pancreatic beta-cell biology to develop stem cell-based therapies for children with diabetes. His work bridges clinical practice and fundamental science, aiming for durable solutions to restore insulin production in young patients. In 2025, Staels also received an ERC Starters Grant.



Robotic microsurgery for lymphedema. © Bart Moens & UZ Brussel

Breakthroughs in Clinical Care

Milestone in Robotic Microsurgery for Lymphedema

In 2025, UZ Brussel became the first hospital worldwide to perform more than 100 robot-assisted lymphovenous bypass surgeries for lymphedema. This minimally invasive technique relieves swelling—often a side effect of cancer treatment—by reconnecting lymphatic vessels to veins.

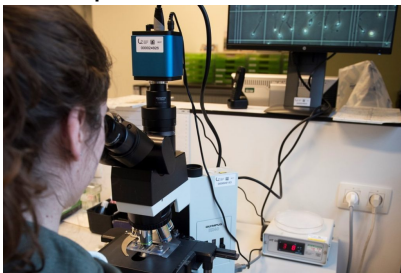
Performed exclusively by Prof. Dr. Alexandru Nistor, the procedures achieved consistent, reproducible outcomes, with faster recovery and shorter hospital stays. Prof. Dr. Nistor is now the most experienced robotic lymphedema microsurgeon globally. The combination of robotic accuracy and highly specialized surgical skill ensures consistent, reproducible outcomes. The procedure is effective across a wide range of patient groups—women after breast cancer, men after prostate cancer, and even those with primary lymphedema.

Fertility Restoration with Testicular Tissue Transplant

Also in 2025, the hospital's reproductive medicine centre, UZ Brussel performed a world-first reintroduction of cryopreserved immature testicular tissue into a man treated with chemotherapy during childhood. Sixteen years after cryopreservation, the tissue was transplanted into the testicle and scrotum, with the goal of restoring natural sperm production. This pioneering work builds on UZ Brussel's 2002 launch of the world's first testicular tissue cryopreservation program. A year after transplantation, the patient will be evaluated for the presence of mature sperm cells.



Transplant of testicular tissue transplant. © Bart Moens & UZ Brussel



AI detection of sperm cells. © Bart Moens & UZ Brussel

AI-Assisted Sperm Cell Detection

At Brussels IVF, researchers partnered with Robovision Healthcare to develop **T'easy**—an AI-based system for rapid sperm cell detection in testicular tissue following TESE (Testicular Sperm Extraction).

When no sperm cells are found in a man's ejaculate, TESE can be performed. This involves removing a small tissue sample from the testes to isolate sperm cells for use in ICSI—a form of IVF where a single sperm cell is injected directly into an oocyte. TESE gives men with severely reduced fertility the possibility of having genetically own children. The technique was first applied at UZ Brussel in 1995 for men with impaired sperm production in the testicles. Since then, this combined strategy has become a routine procedure worldwide—though success rates still vary depending on whether or not sperm cells can be retrieved from the tissue.

T'easy combines an app, a specially adapted microscope, and artificial intelligence to automatically and rapidly detect sperm cells in testicular tissue. The app controls the microscope, ensures sharp image capture, analyses the images with AI, and presents the results in a clear, user-friendly interface. The research team trained the AI using more than 13,000 labelled sperm cells across over 5,000 images.

For now, T'easy is only being used within a research setting. However, for care workers, the application represents significant time savings and allows them to focus their expertise where it is most needed. Manually detecting sperm cells in testicular tissue is

labour-intensive, time-consuming and requires specialised staff, as sperm cells in such samples are often scarce and hard to find.



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