



LIFE SCIENCES & HEALTH

**TOP
DUTCH**
Naturally leading
the transition

Welcome to the Healthy Ageing Capital of Europe, where a strong smart and sustainable ecosystem is leading in developing groundbreaking knowledge and applications for a healthy society for all.

As a wealthy and prosperous country with an inclusive culture, it's no surprise we have high standards when it comes to taking care of our people. The Dutch healthcare system has become one of the best in the world, built on mandatory health insurance, risk equalization and patient empowerment. Today, insights from the life sciences & health industry have shifted our focus from reactive healthcare, towards healthy ageing - or sustainable health. This means we increase our focus and efforts on optimizing prevention, diagnostics and developing specialized health solutions. TopDutch promotes a healthy society where we all enjoy a long life in good health. Here, we grow young.

1. Europe's reference region for healthy ageing

2. BioAnalysis Capital of Europe

3. Hub of knowledge and R&D

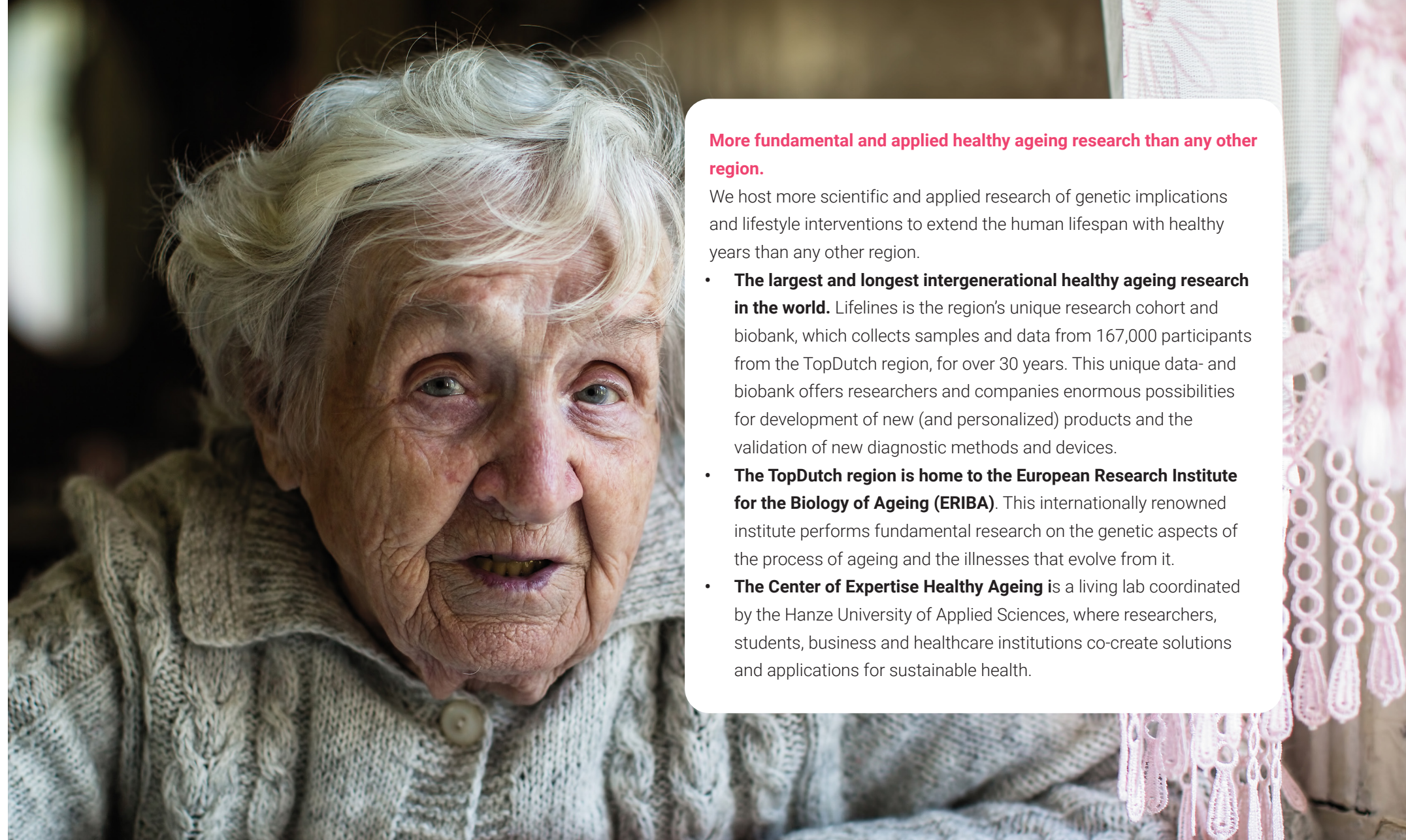
4. Smart and sustainable ecosystem for MedTech

5. Networks and opportunities for partnerships

6. World-class education & highly skilled labor

1. EUROPE'S REFERENCE REGION FOR HEALTHY AGEING

With a decades-long focus on healthy ageing and prevention, TopDutch is recognized as a four-star reference region for Active and Healthy Ageing by the European Commission. Thanks to our network of breakthrough fundamental and applied researchers, innovative businesses from start-ups to multinationals, and cooperative government and civil society, we are leading Europe's transition to sustainable healthcare.

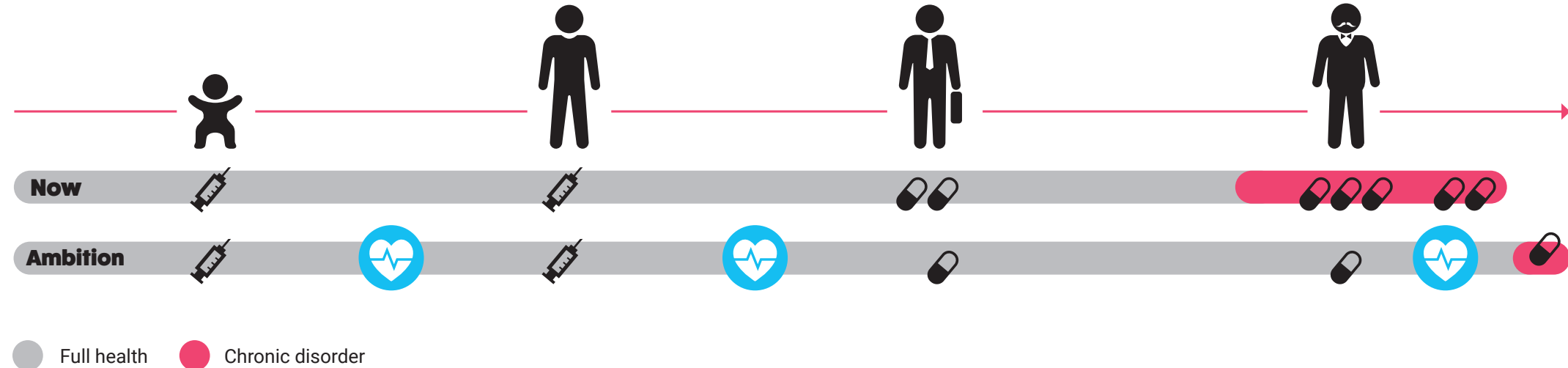


More fundamental and applied healthy ageing research than any other region.

We host more scientific and applied research of genetic implications and lifestyle interventions to extend the human lifespan with healthy years than any other region.

- **The largest and longest intergenerational healthy ageing research in the world.** Lifelines is the region's unique research cohort and biobank, which collects samples and data from 167,000 participants from the TopDutch region, for over 30 years. This unique data- and biobank offers researchers and companies enormous possibilities for development of new (and personalized) products and the validation of new diagnostic methods and devices.
- **The TopDutch region is home to the European Research Institute for the Biology of Ageing (ERIBA).** This internationally renowned institute performs fundamental research on the genetic aspects of the process of ageing and the illnesses that evolve from it.
- **The Center of Expertise Healthy Ageing** is a living lab coordinated by the Hanze University of Applied Sciences, where researchers, students, business and healthcare institutions co-create solutions and applications for sustainable health.

Biological and lifestyle interventions



Traditional

- Treatment
- Prevention

New interventions

- Biological and lifestyle interventions

Our open and cooperative business culture accelerates the development and implementation of healthy ageing solutions with a number of industry networks.

- **Within the Healthy Ageing Network Northern Netherlands (HANNN)**, regional knowledge institutions, governments, society and over 170 businesses, we collaborate extensively in search of innovative and economic activities and in implementing sustainable health solutions.
- **The Aletta Jacobs School of Public Health** - a joint partnership of the University of Groningen, University Medical Center Groningen, the Hanze University of Applied Sciences and NHL Stenden University of Applied Sciences - is a network of researchers and partners with one single goal: more healthy years. Rooted in fundamental research, they share TopDutch knowledge and expertise through education, consultancy and integral collaborations.
- **Hi!Noord (Health Impact North)** is strengthening and developing the TopDutch Healthy Ageing ecosystem by investing in knowledge sharing, collective infrastructure, and talent development programs. Via eight core projects, they are supporting the professional and academic talent, innovative start-ups and community participation that will allow us to continue to lead the sustainable health transition far into the future.

Crossing over with our Digital Innovation sector, we're accelerating the healthy ageing transition by making healthcare systems smarter. TopDutch's e-health cluster is leveraging our region's expertise in Big Data, AI, and sensor technology to create applications that improve patient experience, outcomes and efficiency.

2. BIOANALYSIS CAPITAL OF EUROPE

We are the BioAnalysis Capital of Europe, with the largest BioAnalytical capacity and diversity in Europe. Our open ecosystem of research institutions, bio- and databanks, innovation labs and business networks create the infrastructure within which groundbreaking CROs can easily settle and thrive.



Over 100 LC-MS/MS machines are operational in the region, together having the largest BioAnalytical capacity in Europe.

Largest biobank available from Lifelines longitudinal research cohort, making biodata available not only during, but also in the build-up to the emergence of diseases.

Home to Biomarker Bay, a unique consortium in research, development and application of new biomarkers, which supercharges the development and admission of new individualized and tailored diagnostic methods and drugs.

An expanding business network of high quality CRO's, emerging from knowledge institutions, research consortia, bio- and databanks, the University Medical Center Groningen, innovation labs and business networks Life Cooperative and Bio Cooperative.

- Our world-renowned CROs have expertise in both pharmaceuticals (including ICON, Thermo Fisher, Symeres) and MedTech devices (including XVivo, BD Kiestra).
- The close links between our business community and knowledge institutions allows us to stay on the cutting edge of BioAnalysis. Recent emerging and broadening activities performed by our CROs include genomics-based clinical trials and the integration of advanced data capabilities.


3. HUB OF KNOWLEDGE & INNOVATION

Our Life Sciences & Health industry is founded on ground-breaking research by a continuously growing pool of highly educated and dedicated talent. We support knowledge to market-ready products with a mix of research programs, shared innovation infrastructure, and access to capital.



We offer access to a complete R&D chain; from fundamental research to product validation.

- **Fundamental research** at the University of Groningen (RUG), Zernike Institute for Advanced Materials (ZIAM), the European Research Institute for the Biology of Ageing (ERIBA) and University Medical Center Groningen (UMCG).
- **Applied research** at the Hanze University and NHL Stenden University of Applied Sciences.
- **Product development** within our extensive business network of start-ups, SMEs and testing labs.
- **Product validation** via our cohesive infrastructure of testing facilities and clinical trials for complete validation trajectories.



Our unique research programs feed developments in pharma and medical technology:

- **Biomarker Bay**, a renowned consortium in research, development and application of new biomarkers, which supercharges the development and admission of new individualized and tailored diagnostic methods and drugs.
- **ERIBA**, the European Research Institute for the Biology of Ageing, answers to the question 'why organisms age'.
- **Lifelines** is the region's unique research cohort and biobank (with 167,000 participants), which offers researchers and companies enormous possibilities for the development of new (and personalized) products and the validation of new diagnostic methods and devices.

Our innovation programs and development funds support innovative products to market and offer opportunities for expansion.

- **Open Diagnostics Ecosystem** gives access to knowledge, a strong network, and research & development facilities within the diagnostics ecosystem.
- **PharmaNL** is a public-private consortium with partners including Campus Groningen and LIFE Cooperative, offering ambitious and promising pharmaceutical start-ups, scale-ups and academic research groups access to state-of-the-future shared R&D facilities and developing the human capital needed to exploit the economic potential of innovative pharmaceutical products and production technologies.
- **Campus Community Fund** is a €500 million financial platform that aims to transform the available knowledge and skills on Campus Groningen, and throughout the region, more effectively into important innovations.

4. A SMART AND SUSTAINABLE ECOSYSTEM FOR MEDTECH

Supporting innovation and product and material development via the region's cross-linked green and digital ecosystem.



Together with our strong green chemistry industry, the TopDutch region has an excellent position in the development of all kinds of medical devices, medical and polymer solutions.

- With ZIAM (Zernike Institute for Advanced Materials) and the Biomaterials Development Center as linking pins between fundamental research and business, we are able to develop all types of specialty polymers advanced biomedical and pharmaceutical appliances.
- Polymer solutions spun-off or connected to the University of Groningen and University Medical Center Groningen include: Biodegradable polymeric injectable drug delivery systems from Innocore; custom speciality polymer manufacturing with Polyvation; bioresorbable medical technologies acquired by Regenity and hot start-ups such as Implican.

Cross-linking with our digital innovation ecosystem, the TopDutch region offers advanced data capabilities to support the development of ground-breaking medical technologies with sensor tech and AI.

- Thanks to our large scale studies for data collection (including the largest biobank Lifelines) and an industry focus on personalized health and diagnostics (with players like UMCG, Certe, Philips and KPN), we have developed advanced data capabilities.
- The 'DASH' Data Science Center in Health is a knowledge hub, community, and facilitator in the field of health data science, hosted in the University Medical Center Groningen. Its AI Think Tank and Machine Learning Lab supports the advancement of AI in research and clinical settings.



Cross-linked with our digital innovation ecosystem focused on High Tech and Smart Materials, we are able to develop highly innovative products and technologies.

- We host particularly strong catheter technologies and lens technologies clusters, with exciting new devices coming from our large multinationals such as Johnson & Johnson Vision as well as our in-demand start-ups such as antimicrobial device coating firm Bioprex.
- Revolutionary devices from TopDutch on the market now include an inhaler device developed by PureIMS and perfusion technology for organ transplantations by XVIVO.

Complimented by world-renowned fundamental research from the University of Groningen and University Medical Center Groningen, TopDutch is home to an expanding nuclear medicine cluster.

- With over 70 years of practice, the University Medical Center Groningen is one of the leading and most established nuclear medicine institutes in the world. Their research focuses on the development and validation of new molecular imaging applications, bridging the gap between basic science and clinical applications.
- The Particle Therapy Research Center (PARTEC) is a dedicated research facility functioning in synergy with the UMCG Groningen Proton Therapy Center (GPTC). They uniquely combine technological development, preclinical studies, and patient studies with an R&D program to continuously improve proton therapy technology and treatment, and assess the feasibility of other particles for high-precision radiotherapy. The facility operates a large superconducting cyclotron for experimental research.
- Companies active in Nuclear Medicine in the TopDutch region include medical isotope innovators Shine Technologies, and nuclear and optical molecular imaging CRO TRACER.

5. NETWORKS AND OPPORTUNITIES FOR PARTNERSHIPS

The TopDutch region is famous for its **cooperative, down-to-earth business culture**. Our open life science & health ecosystem supports **knowledge-sharing, welcomes newcomers and supports innovative start-ups** to reach their potential.

Our tight-knit business networks support knowledge-sharing, cooperation, and development in **pharma, MedTech and e-health**.

- **SpringBoard association** aims to stimulate the further development of the medical technology sector in the Northern Netherlands into a top sector for industry, knowledge and skills. The focus here is on medical products and applied research for active and healthy ageing. This allows it to make connections and open doors both in the Netherlands and abroad. Specific knowledge is available within this network with regard to regulations.
- **HANNN, the Healthy Ageing Network Northern Netherlands**, connects companies, knowledge institutions, healthcare parties and governments. From MedTech, Life Sciences and Food, to Care & Cure, Healthy Lifestyle and the gamification research institute Serious Gaming.
- **Life Cooperative** unites life science and MedTech SMEs in the TopDutch region to lobby together, organise together, and develop together.



Innovative life sciences and health start-ups are supported to thrive in the TopDutch region. From pre-seed to scale-up, our services and programs support entrepreneurial talent to take the first step, inviting promising internationals to join us, and facilitating their development via incubators and training.

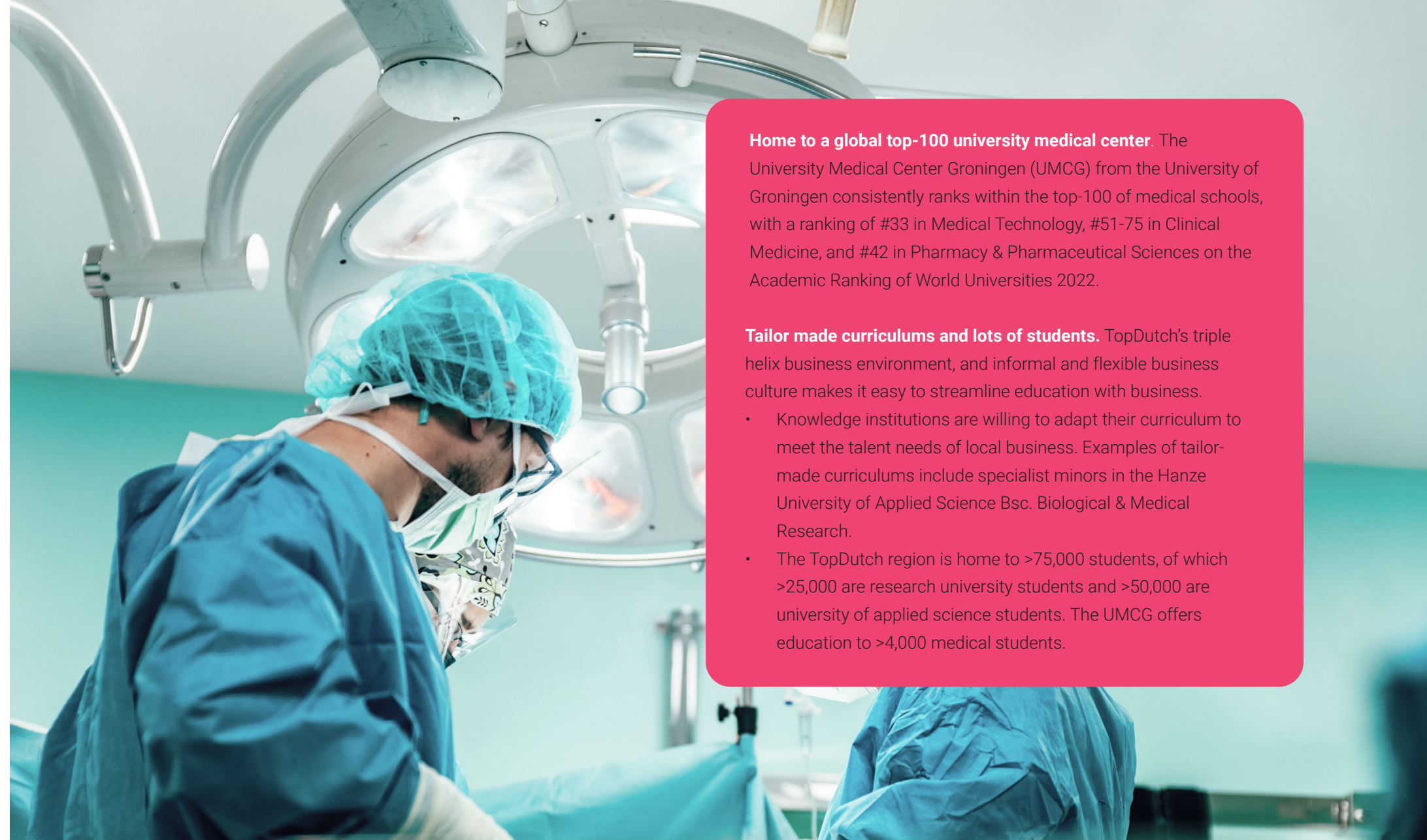
- We offer a wide range of business development programs that support entrepreneurs from the ideation to scale-up phase. These include the Business Development Program from VentureLab North, the Start-Up in Residence Noord-Nederland accelerator program, and the Market Readiness and Investor Readiness Programs from N.V. NOM.
- We connect our start-ups with the right investors for you. We bring together start-ups with institutional investors - including the UMCG's own fund Triade, our angel network, venture capital, strategic investors and private equity.
- We invite international innovators to join us with the Start-Up Visa NL program, a unique accelerator program that allows the brightest entrepreneurial talent from non-EU/EEA countries to start-up in the TopDutch region. Start-ups in the Life Science & Health can join the Campus Groningen facilitator, which stimulates and supports entrepreneurship, and facilitates innovative initiatives. Besides of offering laboratory facilities, Campus Groningen offer support in the fields of business development, business strategy, intellectual property and patenting, legal aspects, budgeting, finance and risk analysis .The facilities are suitable for product development in the (bio)chemical field.



Opportunities for M&A. Our continuous investment in the development of new knowledge and talent results in a constant offspring of new companies developing high-end technologies and products. Large international companies have the opportunity to acquire unique knowledge. Over the last few years successful acquisitions have been done by: ICON, Menicon, MorphoSys, Becton Dickinson, and Johnson and Johnson Vision Care.

6. WORLD-CLASS EDUCATION & HIGHLY SKILLED LABOR

Home to world-class knowledge institutes **educating the health and medical professionals of the future.**



Home to a global top-100 university medical center. The University Medical Center Groningen (UMCG) from the University of Groningen consistently ranks within the top-100 of medical schools, with a ranking of #33 in Medical Technology, #51-75 in Clinical Medicine, and #42 in Pharmacy & Pharmaceutical Sciences on the Academic Ranking of World Universities 2022.

Tailor made curriculums and lots of students. TopDutch's triple helix business environment, and informal and flexible business culture makes it easy to streamline education with business.

- Knowledge institutions are willing to adapt their curriculum to meet the talent needs of local business. Examples of tailor-made curriculums include specialist minors in the Hanze University of Applied Science Bsc. Biological & Medical Research.
- The TopDutch region is home to >75,000 students, of which >25,000 are research university students and >50,000 are university of applied science students. The UMCG offers education to >4,000 medical students.



- **Home to a fast growing Healthy Ageing Campus:** The Healthy Ageing Campus, located in Groningen at the UMCG, has become one of the largest campuses in the Netherlands since its inception in 2012 and continues to grow at a fast pace. The Healthy Ageing Campus connects knowledge/research, government, and business; spurring innovation by offering research and business facilities to spin-offs and start-ups and stimulating open innovation relationships between campus partners.
- **Highly - and up to date - skilled labor:** To stay at the forefront in the development of education and training, we have instituted the hypermodern Wenckebach Skills Center. Within this mini hospital with its own operating room, patient rooms and an Intensive Care unit, healthcare professionals in a range of disciplines and from a variety of educational backgrounds can train new operating techniques and treatment methods, in an extremely lifelike virtual environment. Other aspects including teamwork can also be trained at the Skills Center.



Are you interested in exploring what your business possibilities could be? Connect with **Gerard Lenstra**, our **Life Science & Health expert**.

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Want to find out more about how the TopDutch region is naturally leading the transition, or view the digital edition? Head over to our website www.topdutch.com

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