MuciRNA

Precision mucin profiling for a healthier mucosal barrier

This novel biomarker platform from the University of Antwerp enables an in-depth assessment of barrier integrity by capturing the diversity of mucin RNA isoform expression in biological samples. As such, MuciRNA facilitates patient stratification and evaluation of treatment efficacy and outcomes in barrier-related diseases, including inflammatory bowel diseases (IBD), colorectal cancer, and respiratory tract infections.

Situation before

Mucus is a slimy hydrogel lining the mucosal surfaces of our body and is a key component of the mucosal barrier. Mucins are the gatekeepers of mucus and expressed at the apical side of epithelial cells either as secretory or transmembrane mucins. These highly glycosylated proteins are uniquely suited to interact with the extracellular environment and play an active role in the maintenance of the mucosal barrier function. An imbalance in their expression pattern affects barrier integrity and dictates the development and course of disease.

Given the complexity and global burden of these diseases, there is an urgent need for more precise and effective treatment strategies. Because of the game-changing concept towards a central role for the mucosal barrier function in the therapeutic management of diseases, one promising approach is the identification of disease-specific mucin signatures that map mucosal barrier dysfunction with disease heterogeneity. Such signatures can provide valuable insights into patient stratification and treatment response.

MuciRNA
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or **visit our website** mucirna.com

Technology

Mucin genes generate a diverse repertoire of RNA isoforms through alternative splicing. While many isoforms support normal biological function, others are linked to disease susceptibility. These disease-specific mucin RNA isoforms constitute a powerful new biomarker class, enabling patient stratification and prediction of therapy response. By decoding the mucin RNA isoform landscape, our platform unlocks a new dimension of precision diagnostics across a broad range of mucosal diseases. Importantly, the technology can be applied to both tissue and blood samples, enabling scalable and minimally invasive patient monitoring.

Core offering

- Mucin RNA isoform sequencing, using region-specific panels targeting the gastrointestinal tract
- Biomarker interpretation to guide drug development and personalised therapy
- Functional permeability testing in patient-derived organoids (in development)
- Sample types include biopsies, organoids, and blood

We offer a high-throughput sequencing platform – MuciRNA - encompassing unique mucin RNA isoform panels for the in-depth mapping of mucosal barrier function across heterogeneous diseases. By positioning the mucosal barrier as a central therapeutic target, this platform delivers actionable insights to accelerate drug development, assess treatment efficacy, and improve clinical outcomes.

Partners we search for

This platform is supported by strong intellectual property, including multiple patent applications on mucin biology and its clinical use. Together with deep scientific and clinical expertise, it provides a solid base for further development and commercialisation, targeting pharma, biotech, diagnostics, research institutions, CROs, and medtech organisations focused on precision medicine, inflammatory diseases, and biomarker-driven innovation.

About the researchers

The Laboratory of Experimental Medicine and Pediatrics (LEMP) comprises seven clinical divisions within the Faculty of Medicine and Health Sciences and is closely affiliated with the Antwerp University Hospital (UZA). Its research focuses on inflammation in clinically relevant settings and is driven by strong interdisciplinary collaboration. LEMP conducts integrated experimental, clinical, and translational research, bridging bench to bedside through the application of advanced, state-of-the-art methodologies.

LEMP is led by Prof. Benedicte De Winter, an internationally recognised expert in gastrointestinal barrier dysfunction, visceral pain, and immune responses in IBD, irritable bowel syndrome (IBS), and sepsis. The mucin research within LEMP is primarily led by Prof. Annemieke Smet, an expert in molecular (micro)biology, cell signaling, and omics technologies, and is co-led by Prof. De Winter. Together, they head a multidisciplinary team, consisting of 1 postdoctoral researcher (Dr. Baptiste Oosterlinck) and 3 PhD students (Julie Gassman, Lien Schrooten, and Isabella Da Silva), that is recognised as a driving force in mucin biology at the University of Antwerp (UAntwerp). Furthermore, Prof. Arantza Jauregui Amezaga is gastroenterologist at UZA with expertise in the IBD field. She has been collaborating with Profs De Winter and Smet for years in translational studies in IBD (UZA-LEMP) resulting in the establishment of the UAntwerp/UZA IBD biobank.