MaxImmun Newsletter

September 2026
Issue n°2

The latest news, views, and announcements from MaxImmun

Summary

MaxImmun: Unlocking the Potential of Antimicrobial Peptide Inducers

Antimicrobial resistance (AMR) continues to rank among the most pressing global public health challenges. According to the latest estimates, bacterial AMR was directly responsible for approximately 1.14 million deaths worldwide in 2021 and contributed to nearly 4.7 million deaths overall. Without effective action, the burden of AMR is expected to increase significantly in the coming decades, threatening modern medicine and global health systems.

In Europe, AMR is estimated to cause more than 35,000 deaths every year, while placing a substantial economic burden on healthcare systems. Recognising the urgency of the situation, the World Health Organization has repeatedly highlighted the critical shortage of innovative antimicrobial treatments, warning that the clinical pipeline for new antibiotics remains insufficient to meet current and future needs.

Against this backdrop, MaxImmun is pioneering a novel strategy to combat infectious diseases and reduce the spread of AMR through its antimicrobial peptide (AMP) inducer technology. Rather than relying on conventional antibiotics, this innovative approach harnesses the body's own innate immune system by stimulating the production of human AMPs, natural defence molecules produced at mucosal surfaces that play a key role in protecting against infection.

The strength of this technology lies in identifying immuno-stimulatory molecules capable of safely inducing therapeutic levels of endogenous AMPs. By enhancing the body's natural immune response instead of directly attacking pathogens with external antimicrobials, MaxImmun aims to reduce the selective pressure that drives the emergence of resistant bacteria.

This host-directed therapeutic approach offers a promising and more sustainable alternative to traditional antibiotics. By minimising resistance selection and limiting the release of antimicrobial residues into the environment, it has the potential not only to improve patient outcomes but also to help curb the spread of AMR across humans, animals, and ecosystems, in line with the One Health approach.

Human Organoids: a Next-Generation Preclinical Model for Antimicrobial Innovation

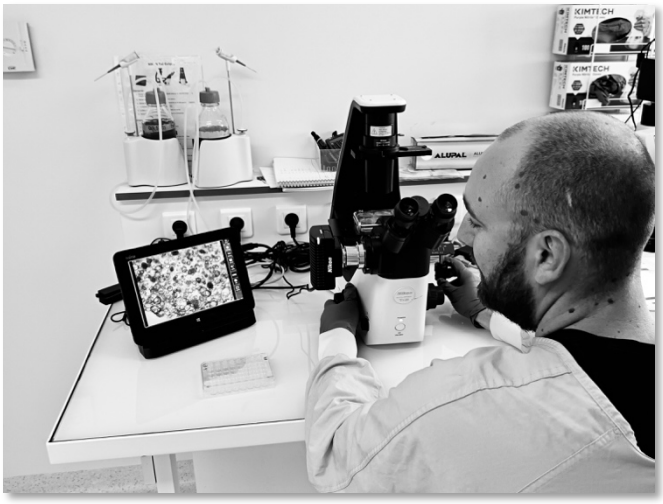
As the search for innovative alternatives to conventional antibiotics accelerates, the need for predictive and physiologically relevant preclinical models has never been greater. Among the most promising advances in biomedical research are human intestinal organoids, three-dimensional mini-tissues that reproduce the structural and functional characteristics of the human intestinal epithelium.

Derived from adult stem cells or induced pluripotent stem cells, intestinal organoids contain the major epithelial cell types found in the gut, including enterocytes, goblet cells, Paneth cells and enteroendocrine cells. This cellular diversity allows them to closely mimic the architecture, barrier function and innate immune responses of the human intestine, providing a powerful platform for translational research.

Unlike conventional two-dimensional cell cultures, organoids recreate the complex interactions that regulate epithelial homeostasis and host defence. They therefore offer a unique opportunity to evaluate how novel therapeutic candidates interact with human tissues under conditions that more closely resemble the *in vivo* environment, while reducing reliance on animal models.

For the development of AMP inducers, human intestinal organoids are particularly valuable. They enable researchers to assess whether candidate molecules can stimulate the endogenous production of AMPs, strengthen epithelial barrier integrity and modulate innate immune responses without inducing toxicity or compromising tissue function. Because these models preserve key signalling pathways involved in mucosal immunity, they provide highly relevant insights into the biological mechanisms underlying host-directed therapies.

Organoid-based assays also facilitate the evaluation of efficacy against enteric pathogens, the identification of biomarkers of response and the optimisation of dosing strategies before advancing to *in vivo* studies. Their human origin increases the predictive value of preclinical findings and may improve the translation of promising candidates into clinical development.



Romain Dautreppe at IRSD platform

As innovative strategies emerge to tackle AMR, human organoid technologies are becoming an essential component of the preclinical toolbox. By combining biological relevance, experimental flexibility and translational potential, they are helping to accelerate the development of next-generation therapeutics that harness the body's own defence mechanisms-including AMP inducers to combat infectious diseases more effectively and sustainably.

Fostering the Next Generation of AMR Researchers: MaxImmun Training School at Royaumont

From March 2-4th, the MaxImmun consortium gathered at the Royaumont Abbey in France for its Training School, bringing together early-career researchers, PhD students, postdoctoral fellows and principal investigators from across Europe. The event provided a unique opportunity to strengthen scientific knowledge, promote interdisciplinary collaboration

and inspire the next generation of researchers tackling AMR.

Over several days, participants attended a series of lectures and scientific discussions covering the latest advances in host-directed therapies, innate immunity, microbiology, medicinal chemistry, preclinical models and translational research. The programme combined expert presentations from consortium partners with hands-on sessions designed to encourage critical thinking and knowledge exchange.

One of the highlights of the Training School was the opportunity for young scientists to interact with experts from different fields. These exchanges not only stimulated scientific discussion but also helped participants develop valuable communication skills and broaden their perspectives on multidisciplinary research.

Young European scientists at Royaumont

Beyond the scientific programme, the Training School fostered networking and collaboration within the consortium. Informal discussions and social activities created an environment where early-career researchers could build connections with senior investigators, exchange ideas and explore future collaborations across institutions and disciplines.

By investing in training and knowledge sharing, MaxImmun is helping to build a strong European community of scientists equipped to address one of the greatest public health challenges of our time. The Training School highlighted the consortium's commitment not only to scientific excellence but also to mentoring young researchers and fostering the collaborative spirit that drives innovation.

"The Training School was much more than a scientific event, it was an opportunity to create connections, share ideas and build the collaborative network that will drive MaxImmun forward."

MaxImmun Consortium Meets in Braunschweig for its 2026 General Assembly

On June 30th, 2026, the MaxImmun consortium gathered in Braunschweig, Germany, for its annual General Assembly, hosted by the Helmholtz Centre for Infection Research (HZI) partner. The meeting brought together principal investigators and young researchers from across Europe to review progress, share scientific achievements and discuss the next steps in the development of innovative host-directed therapies against AMR.

Throughout the day, partners presented the latest results from each work package, highlighting significant advances in AMP inducer discovery, optimization and preclinical validation. The Assembly also provided an opportunity to strengthen collaboration between partners, align upcoming activities and prepare for the project's next milestones.

Beyond scientific updates, the meeting reaffirmed the consortium's shared commitment to developing sustainable alternatives to conventional antibiotics and accelerating innovation in the fight against AMR. The productive discussions and collaborative spirit demonstrated once again the strength of the MaxImmun partnership as it moves into the next phase of the project.

Funded by
the European Union