YUMAB GmbH
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Next-generation therapeutic antibodies for infectious diseases: an alternative to antibiotics

Biotechnology company YUMAB is located in Germany's infectious disease research hotspot. The company's discovery and development platform delivers fully human antibodies using fast and reliable technologies, making it well suited for the development of novel antibody-based solutions in the infectious disease space.

In the race to address the global threat of antibiotic resistance, attention is turning to therapeutic antibodies as an alternative approach to treating infectious diseases. Antibacterial monoclonal antibodies (mAbs) could offer more effective ways of addressing antibiotic resistance and bacterial infections by targeting conserved pathways and activating the body's immune system[1]. The potential benefits of antibacterial mAbs include extending and saving the lives of patients infected with drug-resistant strains of bacteria, reducing the toxicity associated with high antibiotic doses, and saving time and costs in hospital associated with complications resulting from surgery[1].

When fighting against pathogens, the adaptive immune system generates T cells and antibody-producing B cells that can provide lifelong immunity as a second line of defense, if innate immune mechanisms fail. Prophylactic vaccination mimics an infection and achieves similar protection. However, immunization can fail owing to immunosuppression, lack of previously acquired immunity, outbreaks of emerging pathogens or imperfect vaccine design, requiring other strategies to stop or prevent an infection.

mAbs could fight infections prophylactically and therapeutically, but pathogen variability, mutational resistance, multiple entry and pathogenic mechanisms challenge efficacy. Emerging strategies include the use of mAbs that target crucial pathogen epitopes, oligoclonal antibodies and antibody–drug conjugates, all of which require robust, rapid antibody development platforms.

"Developing vaccines and antibiotics is complex and time-consuming, and there is an urgent need to find new ways of addressing antibiotic resistance," said Thomas Schirrmann, CEO at YUMAB. "Developing antibodies may offer an alternative treatment option, which could give patients the chance to survive an infection and develop resistance against the pathogen."

> **"YUMAB's platform provides access to biologic drug candidates that have evolved over millions of years of exposure to pathogens**
>
> Thomas Schirrmann, CEO, YUMAB

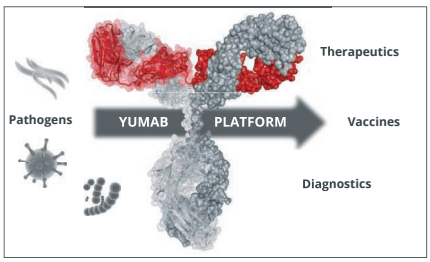

Fig. 1 | YUMAB's integrated discovery and development platform for fully human mAbs, from target to optimized lead, combines state-of-the-art and next-generation technologies.

Rapid discovery of human mAbs

YUMAB is a global provider for the discovery and optimization of fully human mAbs. With deep expertise in infectious diseases and an advanced fully human mAb discovery and development platform, YUMAB can help clients and partners to drive infectious disease programs from basic research to clinical translation. The YUMAB platform delivers fully human mAbs using fast and reliable in vitro discovery technologies from universal or patient libraries that have high success rates even for the most difficult targets. This platform enables the identification of antibodies with broad or targeted specificity for better diagnostics, vaccines, and drugs (**Fig. 1**).

The mAbs can be tailored to the specific needs of any kind of mAb development program, at any stage, and with the properties needed for novel prophylactic or therapeutic strategies against infectious diseases. The in vitro discovery process takes just 8–10 weeks for identification of antibody candidates, including small-scale production of antibody protein for functional testing.

YUMAB's highly diverse, universal fully human antibody library contains more than 100 billion naturally derived antibody sequences and specificities to all types of antigen. Additionally, YUMAB library technologies can be applied to generate custom libraries from blood samples of previously infected patients providing access to neutralizing antibodies. Unlike animal-derived, chimeric, humanized or synthetic antibodies, each YUMAB antibody sequence has been shaped in the human body, which maximizes epitope diversity and overcomes restriction by in vivo immune responses, while minimizing immunogenicity and potential adverse effects in clinical development. Hence, the antibody candidates of the YUMAB repertoire have properties that are desired for a successful drug and are available in several recombinant formats.

"YUMAB's platform provides access to biologic drug candidates that have evolved over millions of years of exposure to pathogens," Schirrmann said. "We can rapidly develop advanced antibodies from universal or patient libraries and identify novel immunogenic targets for vaccine development with our unique target discovery platform."

Flexible collaboration and CRO strategy

Only six years after its start in Braunschweig, YUMAB moved its headquarters and labs to larger premises at Germany's infection research hotspot: Science Campus Braunschweig South. Co-located with the Helmholtz Centre for Infection Research (HZI) and the German Collection of Microorganisms and Cell Cultures (DSMZ), the new location is an ideal environment for YUMAB to expand its collaboration network in this field with ongoing and new partnerships to tackle antimicrobial resistance challenges and the prevention of pandemic threats.

YUMAB's flexible and broad collaboration strategy maximizes the impact of its antibody technology and enables the development of novel mAb-based solutions in the infectious disease space. The company is open to clients for CRO services and partners in biopharma, biotech, and the diagnostic industry, as well as partners with innovative research projects who need a reliable partner in human antibody development.

"Our versatile technology platform combined with a long-standing and proven expertise make YUMAB the partner of choice for the development of novel antibodies for therapeutic applications, diagnostics or vaccines tailored to the clients' needs," said Schirrmann. "Not only can we use our own libraries, we can also generate new immune libraries from patients, which offers interesting opportunities for novel approaches in the infectious disease field."

1. European Federation of Pharmaceutical Industries and Associations. *Antibacterial Monoclonal Antibodies*. https://www.efpia.eu/we-wont-rest/innovation/antibacterial-monoclonal-antibodies/

contact
Thomas Schirrmann, CEO
YUMAB GmbH
Braunschweig, Germany
Tel: +49 531 481170-0
Email: info@yumab.com