

Allele awarded NIH grant to develop nanoantibody therapies for treatment of sepsis

The National Institute of General Medical Sciences of NIH has awarded a Small Business Innovative Research grant to Allele Biotechnology and Pharmaceuticals to develop new single-domain nanoantibody (nAb) therapies for the treatment of sepsis. Sepsis and septic shock are among the leading causes of death in intensive care units (ICUs). The global incidence of sepsis has increased over the years, while the mortality rate, which can reach over 60% for septic shock, has been virtually unchanged for the past three decades due to lack of a cure or effective treatments.

Scientists at Allele have focused on how to intervene with so-called “cytokine storm,” an intense inflammatory response that occurs early in the pathogenesis of sepsis and causes vascular endothelial barrier dysfunction. Other companies have attempted to develop sepsis therapeutics using conventional monoclonal antibodies targeting similar upstream cytokines. However, monoclonal antibody drugs failed to meaningfully improve the mortality rate of sepsis in clinical trials, because the antibodies did not produce significant enough benefits to patients within the relevant time window.

Allele has engineered novel multi-valent and multi-specific nAbs, originally identified from an immunized llama, to combat cytokine storms. These nAbs have superior therapeutic efficacy over conventional antibody drugs in animal models of sepsis because of their unique structural and functional properties. nAbs, also known as VHH domains, are small fragments of antibodies (12-15 Kd) that are very stable and easy to

produce. Allele's research team has found that this class of antibodies possess an outstanding capacity to penetrate to tissues and tumors. Moreover, nAbs can bind epitopes that are difficult for conventional antibodies to access. The first ever approval of a nAb-based drug—caplacizumab, a von Willebrand factor (vWF) target—has been issued to a Belgian company, Ablynx, which has worked almost exclusively on nAbs for 17 years. Ablynx was recently acquired by Sanofi for \$4.8 billion.

Allele's involvement in the nAb field began in 2008. The biotech company has received continued NIH funding since 2011 and private investments since 2013. These funds strengthened Allele's platform, allowing Allele to drastically enhance its capacity of internal research and outside collaboration. Allele now generates high quality nAbs targeting the most devastating diseases including cancers, inflammation, neurological and ophthalmological diseases, and possesses dozens of exciting nAb drug candidates in its pipeline. With the new funding support from NIH, Allele will aggressively move towards clinical stage in finding a much-needed medicine that reduces death from sepsis.

Source:

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