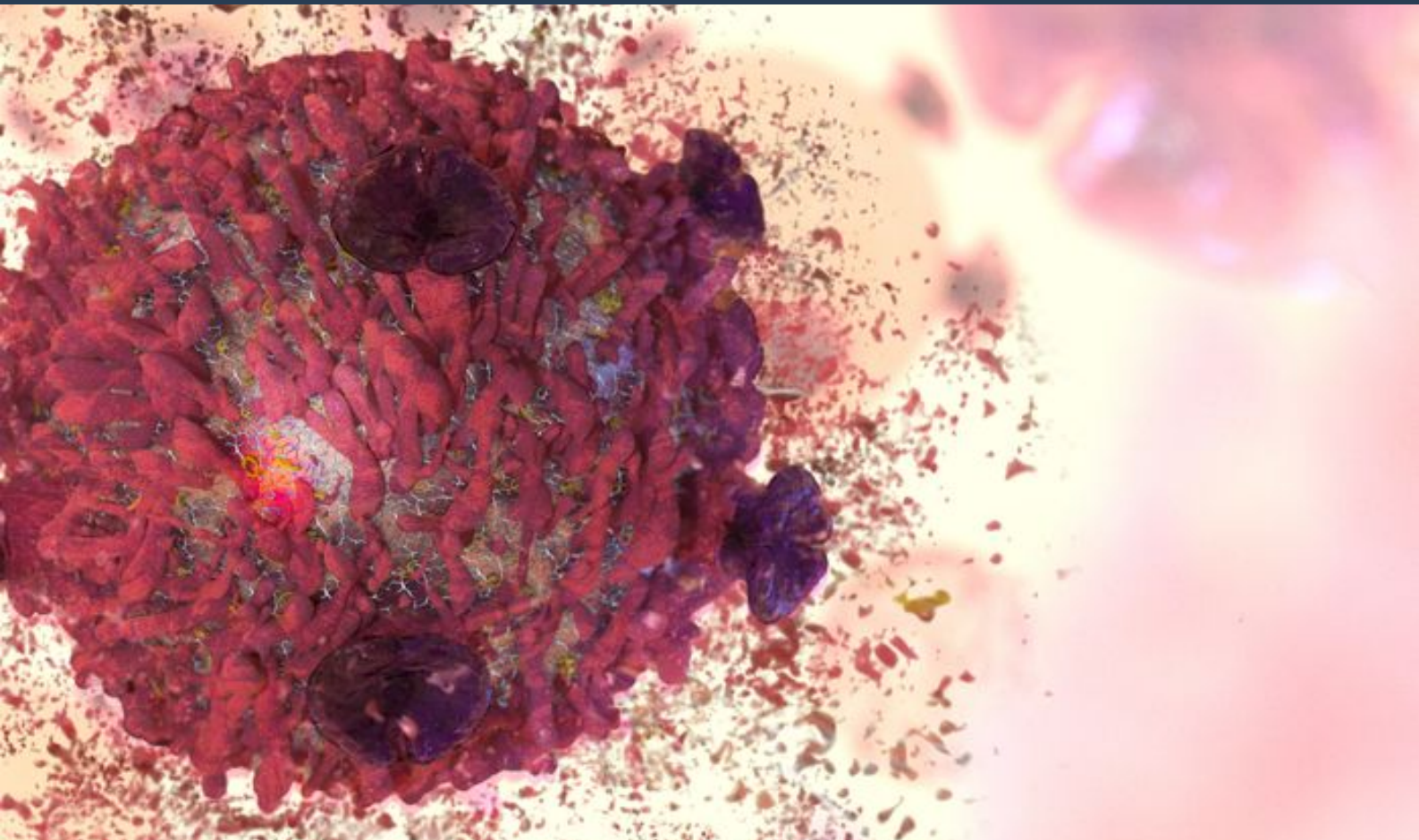


New Selective Anti-complement Molecules

Molecules that can interact with different complement components, to selectively inhibit specific pathways of complement activation.



Please note, header image is purely illustrative. Source: Catalin, Adobestock

IP Status

Patent application submitted

Seeking

Development partner, Commercial partner, Licensing

About **University of Liverpool**

By facilitating access to our expertise, facilities and networks, the University of Liverpool offers the means to transform ideas into creative solutions, improved performance, new technologies, strategies, applications, products or skills.

Background

The complement system is important in defence against infection by attacking invading pathogens and driving the inflammatory response. However, uncontrolled complement activation can cause harm because of excessive collateral damage to healthy tissues. This can lead to acute and chronic inflammatory or auto-immune diseases. These remain clinical areas in need of better therapeutics. Such conditions could benefit from anti-complement treatment that selectively reduces the excess complement activity without limiting the pathogen-killing properties.

Tech Overview

Researchers at the University of Liverpool have developed molecules that can interact with different complement components, to selectively inhibit specific pathways of complement activation. By targeted blocking of the classical and mannose binding lectin (MBL) pathways without complete suppression of the alternative pathway, the risks of developing infection would be significantly reduced.

Utilizing their expertise in therapeutics development, the researchers have synthesized functional compounds within their laboratory. The physiological relevance has been determined using binding studies and by measuring complement activity in serum using functional assays for either classical, MBL or alternative pathway activation. The molecules significantly inhibit classical and MBL but not the alternative pathway. The researchers have translated these findings into animal models, demonstrating that complement activation can be inhibited in vivo along with complement-induced organ injury.

Applications

The recent interest in anti-complement therapies has been fuelled by a number of factors. Genetic association studies have firmly linked complement to common diseases. The success of a C5-specific monoclonal antibody, eculizumab (Soliris; Alexion Pharmaceuticals), in an orphan application: treatment of paroxysmal nocturnal haemoglobinuria (PNH) has also been ground-breaking. Eculizumab is now also used successfully in atypical haemolytic uraemic syndrome (aHUS). Eculizumab is the highest revenue Orphan Drug in 2016 and 'next-generation' molecules are in clinical trials (ALXN1210 and ALXN5500). Elsewhere, the C3 blocker compstatin and an antibody antigen-binding fragment directed against Factor D, administered intra-vitreally, have undergone clinical trials for age-related macular degeneration (AMD).

The market is also growing because the list of diseases in which complement has a role is long and increasing. Potential new markets for exploration beyond inflammatory conditions include infectious, degenerative, traumatic and neoplastic disorders.

Opportunity

A patent application was filed in 2018, and covers both the *in vitro* and *in vivo* use of these molecules to selectively inhibit complement activation.

The University of Liverpool is currently seeking a licensing partner to provide expertise in the commercialisation of the technology.

Patents

- Patent has been filed with a priority date of March 2018, PCT/GB2018/050789