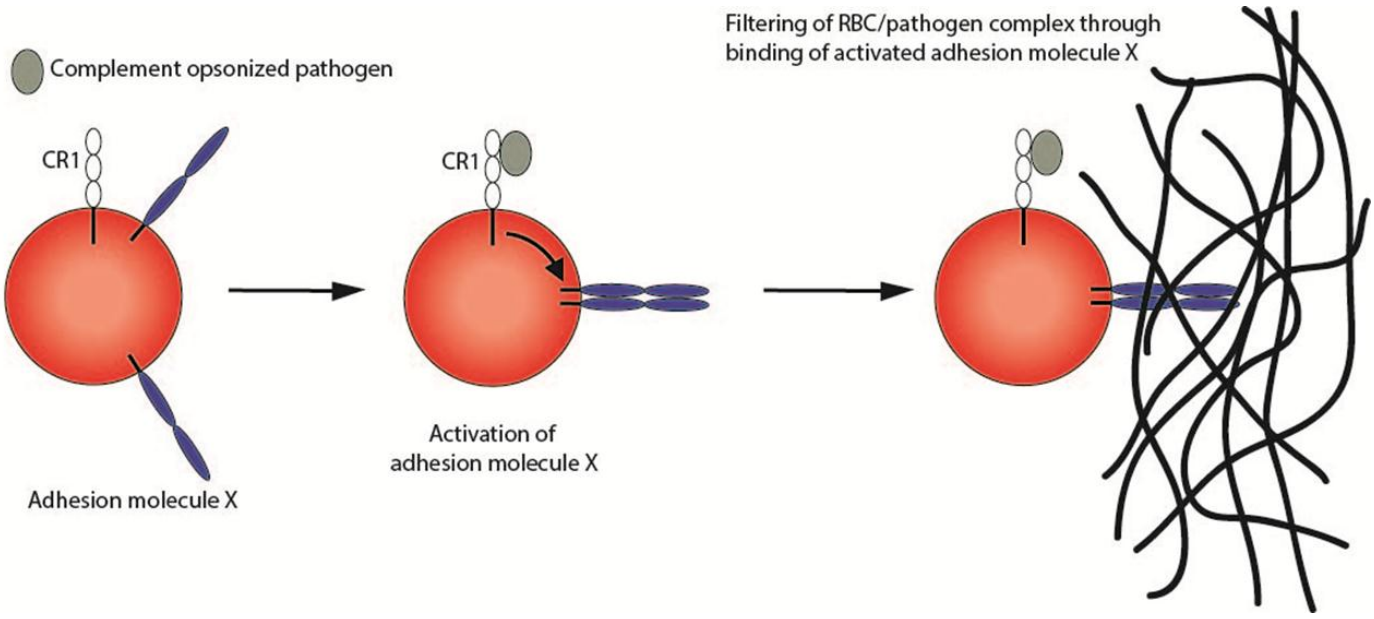
Licensing Opportunity

Treatment of sepsis through depletion of red blood cell/pathogen complexes by apheresis.

- **This technology provides a generic method to reduce the pathogen load in blood of sepsis patients in a fast manner and is applicable for all complement opsonized pathogens which give rise to sepsis.**
- **This technology can be easily incorporated in existing apheresis units.**
- **This technology is based on filter material that can be produced at low cost.**

Blood Transfusion | Apheresis 2015



Background

Sepsis occurs when an individual's immune system is unable to efficiently counteract an infection and remove pathogens from the blood stream resulting in an uncontrolled systemic inflammatory response. Red blood cells (RBCs) play a critical role in the clearance of pathogens by binding and transporting opsonized pathogens to macrophages in the liver and spleen by using complement receptor 1 (CR1, CD35) However, in septic patients, the pathogen load is too high for effective clearance.

The Technology

Researchers at Sanquin have recently discovered that the binding of complement opsonized pathogens to RBC complement receptor 1 results in activation of adhesion molecules on the RBCs, making them 'sticky'. The present invention focuses on exploiting the activated adhesion molecules to filter RBC/pathogen complexes from the blood of septic patients, using selective filter material. The invention is applicable in a wide range of different infections since it targets the adhesion molecules on the RBC and not the pathogen itself.

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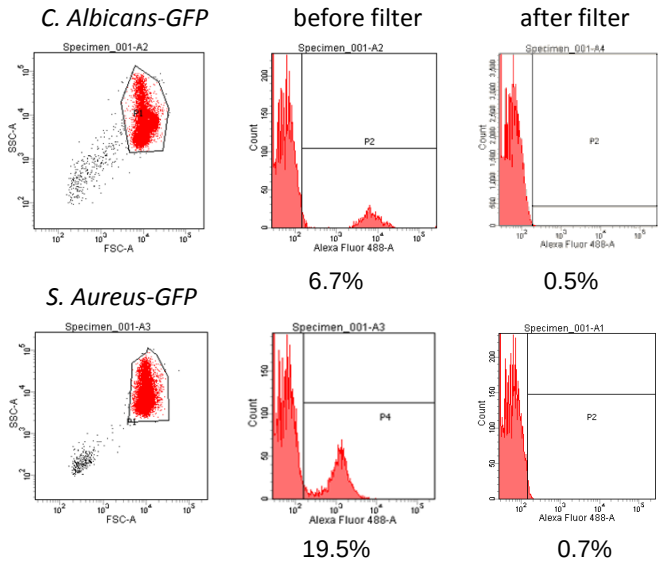

Depicted are the depletion of RBC carrying opsonized *C. albicans* and *S. aureus* from a RBC suspension after single passage through a filter. The percentages of RBC/pathogen complexes are indicated for each condition.

Inventors

Department Blood Cell Research, Sanquin Research:
- Dr. Robin van Bruggen

Patent application

EP15152486.5 Methods and systems for the removal of pathogens from blood.

Priority date: Jan 26th 2015.

Key publications

1. Li J, Wang JP, Ghiran I, Cerny A, Szalai AJ, Briles DE, Finberg RW. Complement receptor 1 expression on mouse erythrocytes mediates clearance of Streptococcus pneumoniae by immuneadherence. Infect Immun. 2010 Jul;78(7):3129-35.

2. Repik A, Pincus SE, Ghiran I, Nicholson-Weller A, Asher DR, Cerny AM, Casey LS, Jones SM, Jones SN, Mohamed N, Klickstein LB, Spitalny G, Finberg RW. A transgenic mouse model for studying the clearance of blood-borne pathogens via human complement receptor 1 (CR1). Clin Exp Immunol. 2005 May;140(2):230-40

3. Glodek AM, Mirchev R, Golan DE, Khoory JA, Burns JM, Shevkoplyas SS, Nicholson-Weller A, Ghiran IC. Ligation of complement receptor 1 increases erythrocyte membrane deformability. Blood. 2010 Dec 23;116(26):6063-71