

CELL-FREE PRODUCTION OF RHESUS BLOOD GROUP ANTIGENS

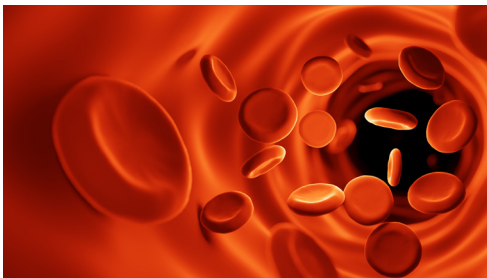
Cell-free method for the production of red blood cell (RBC) proteins for use in hematology diagnostic.

ERGANEEO

L'AVENIR EST FAIT D'AUDACE

PRESENTATION

Red blood cell (RBC) allo-immunization is the immune response of an individual to foreign RBC antigens not present on the surface of their own cells. An efficient detection of alloantibodies is of major interest to manage transfusions in regularly transfused patients, or for the pregnancy follow-up in the context of haemolytic disease of the foetus and new-born (HDFN). However, The Rh blood group system is one of the most polymorphic and immunogenic system, defined by least 54 Rh antigens, some of which being very rare in the population. To date, available commercial test cell reagents, composed of red cell panels expressing different Rh phenotypes, are able to encompass only few of these Rh specificities. Researchers have developed a cell-free system for the production of RH proteins, allowing to obtain large quantities of these proteins in their native state. The method, validated on RhD and RhD-RhAG antigens, relies on the use of in-house assembled nanodiscs, able to incorporate membrane proteins, preserving not only the solubility but also the conformation of newly synthesized membrane proteins. This is to date the first method allowing to generate *in vitro* Rh antigens with a correct conformation and, thus, ready to be tested by several antibodies, thereby representing a new approach for diagnostic in hematology laboratories investigations.



Red-Blood-cell antigens - Rhesus phenotypes - Blood transfusion
Cell-free antigen production - Protein conformation

APPLICATIONS

- Diagnostic in hematology (cell-independent detection kit for antibody screening and identification)
- Research tool for the cell-free production of proteins in their native conformation

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COMPETITIVE ADVANTAGES

- Method not relying on the availability of RH group antigens in the population
- No need to use biological material such as RBC panels
- Production of soluble antigens in their native conformation

DEVELOPMENT PHASE

- ✓ Optimization of the production system, in particular of the composition of nanodiscs
- ✓ Production has been validated for RhD and RhD-RhAG antigens and can be extended to their variants
- ✓ Validation of RhD and RhD-RhAG recognition by several commonly used antibodies

INTELLECTUAL PROPERTY

International patent application in 2017 (WO/2017/064294A1)
Patent delivered in EP, US, CN and CA