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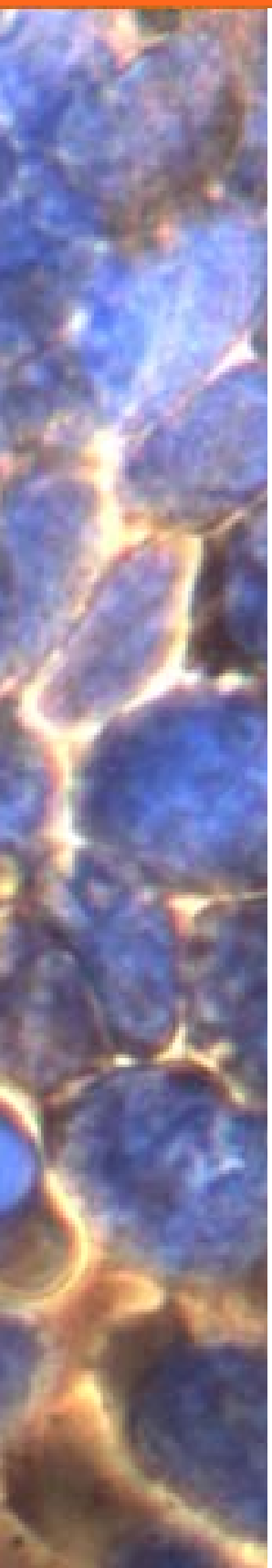
Blood Research Institute

Reagent: Designer Platelets



In Brief

CRISPR customized platelets or cells with specific alloantigens for use in blood typing, diagnostics or platelet transfusions.

Description

Typing for platelet-specific alloantigens is important for the diagnosis of immune thrombocytopenias, especially neonatal alloimmune thrombocytopenia (NATP), for finding compatible donors for platelet transfusions and for assessing the risk of thrombosis.

This technology allows the creation of "Designer Platelets" or hematopoetic progenitor cells with any known combination of alloantigen subtypes. Using the gene editing platform, CRISPR/Cas-9, platelets can be designed with any known rare alloantigen type. This is useful as a laboratory control during platelet typing. One day this system might also be used to produce platelets for transfusions.

Of special value is the deletion of HLA antigens on the platelet surface. Current techniques require the use of additional reagents and tests to rule out cross reaction of antibodies from patient sera to HLA antigens present on the surface of donor-derived platelets.

Benefits

- Provides a reliable supply of very rare platelets
- Greater efficiency in laboratory testing
- Eliminate the need to recruit and draw platelet donors for laboratory studies
- Cost and time savings

Inventor Peter Newman

*Patent protection*US20160139124A1

Method to bioengineer designer platelets using gene editing and stem cell methodologies

Publications

Zhang N, Zhi H, Curtis BR, Rao S, Jobaliya C, Poncz M, French DL, Newman PJ. CRISPR/Cas9-mediated conversion of human platelet alloantigen allotypes. *Blood*. 2016;127:675–680.

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