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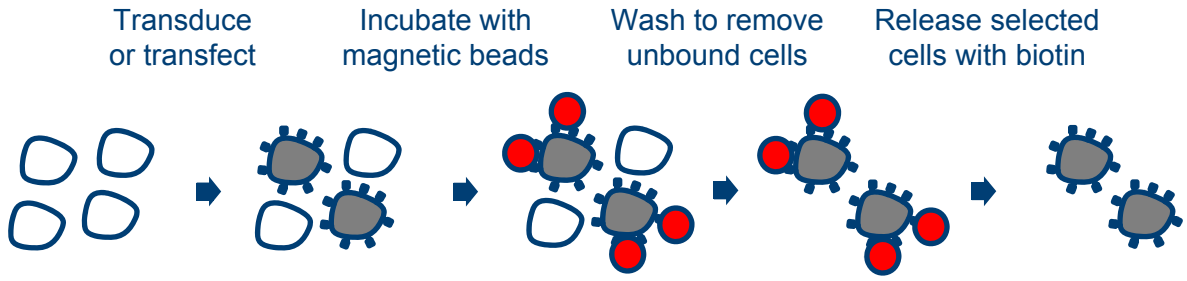
Antibody-Free Magnetic Cell Sorting



A team from the University of Cambridge has developed a method for Antibody-Free Magnetic Cell Sorting of transfected or transduced cells.

Advantages:

- Positive selection of “untouched” cells
- Target gene overexpression or knockdown
- Enrichment following CRISPR/Cas9 genome editing
- No requirement for antibodies
- No restriction on cell type or species
- Simple, fast and cost-effective

For further information please contact:

Chunjing Gu
Chunjing.gu@enterprise.cam.ac.uk
+44 (0)1223 760339
Cambridge Enterprise Limited, University of Cambridge
Hauser Forum, 3 Charles Babbage Road, Cambridge CB3 0GTUK
www.enterprise.cam.ac.uk

Case Ref: Mat-2811-13

Background

Cell separation technology plays an important role in the fields of microbiology, biotechnology and bioscience, which have wide applications in the pharmaceuticals and healthcare industries. Existing methods suffer disadvantages of time, cost and scalability and, when antibodies are used to bind exogenous cell surface markers for magnetic selection, typically yield cells coated with antibody-antigen complexes and beads.

Technology

To overcome these limitations the inventors from the University of Cambridge have developed a method termed Antibody-Free Magnetic Cell Sorting in which the 38 amino acid Streptavidin Binding Peptide (SBP) is displayed at the cell surface by the truncated Low Affinity Nerve Growth Factor Receptor (LNGFR) and used as an affinity tag for one-step selection with streptavidin-conjugated magnetic beads. Cells are released through competition with the naturally occurring vitamin biotin, free of either beads or antibody-antigen complexes and ready for culture or use in downstream applications.

Antibody-Free Magnetic Cell Sorting is a rapid (<1 hour), cost-effective, scalable method of magnetic selection applicable to either viral transduction or transient transfection of cell lines or primary cells. No antibody is required, allowing rapid one-step affinity purification and making the process extremely cost-effective. Enrichment to greater than 99% purity is routinely achieved and no adverse effects are seen on cell viability or function.

As well as target gene over-expression or knockdown, this technology also allows isolation of cells following CRISPR/Cas9 genome editing, enabling enrichment of cells carrying the desired gene knockout or knock-in.

Commercialisation

We are seeking a commercial partner for licensing, collaboration and development of this technology, which is protected by patent application number: GB 1410262.8

Figure 1: The SBP-ΔLNGFR selectable marker

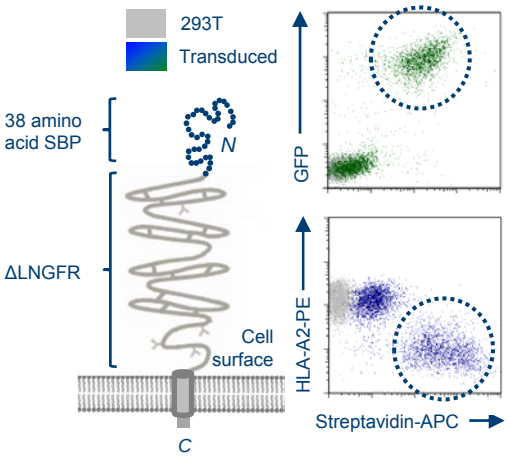


Figure 2: Optimised Antibody Free Magnetic Cell Sorting of primary human CD4+ T cells

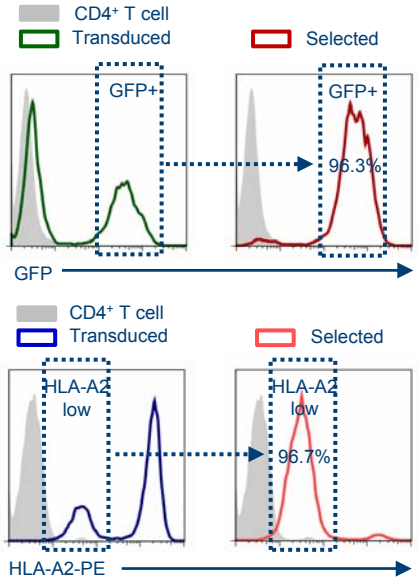


Figure 3: Purification of cells following CRISPR/Cas9 genome editing