

ORAL PRESENTATION

Open Access

Translating research flow cytometry assays for characterization of cellular therapeutics

John DM Campbell

From 1st Annual Meeting of the Scottish Society of Cytomics (SCC) 2014. "Translational Cytometry from Bench to Bedside"

Aberdeen, UK. 25 September 2014

Cellular therapy is a rapidly growing area of medicine, particularly immune therapies for infection and cancer, as well as therapies that aim to regenerate diseased or damaged tissues. Flow cytometry is one of the most important tools in the development of novel cellular therapeutics. Cellular identity, viability and differentiation status are essential data to be collected and validated throughout the manufacturing process. Flow cytometry is used in characterization of raw starting material; as an in-process control; to define the final product and also is often an essential tool to monitor responses in treated patients. In this presentation, the technical aspects of whole blood rare cell flow cytometry (such as circulating dendritic cells) were discussed, and how this can be applied to complex cultures of stem cells differentiating into blood cells for therapeutic use. These cultures contain CD45+ stem cells; nucleated RBC; enucleated RBC; as well as free nuclei and debris. Enucleating *in vitro* RBC could be simply quantified by using staining with CD45, CD235a, DRAQ5 DNA staining and DAPI dead cell exclusion. Staining was performed on raw culture supernatant (as would be performed in a no lyse no wash blood preparation), then diluted before flow cytometry analysis [1]. The other area discussed in this presentation was the improved identification of chemokine receptor expression on cells for therapy by flow cytometry. Chemokines orchestrate the movement and homing of cells in the body. The ability to manipulate the expression of chemokine receptors is a major focus of cellular therapeutics research. In this presentation, the use of biotinylated chemokines tetramerized with streptavidin-fluorochromes was discussed as a method to improve staining of chemokine receptors by flow cytometry. These labelled human ligands stain cells strongly, often more

strongly than antibodies, and have the unique advantage that they can be used across species boundaries. Additionally, these reagents can be combined with magnetic bead sorting to isolate chemokine receptor-positive cells with improved *in vitro* and *in vivo* migration capacity [1].

Published: 16 April 2015

Reference

1. Le Brocq ML, Fraser AR, Cotton G, Woznica K, McCulloch CV, Hewit KD, McKimmie CS, Nibbs RJ, Campbell JD, Graham GJ: **Chemokines as novel and versatile reagents for flow cytometry and cell sorting.** *J. Immunol* 2014, **192**:6120-6230.

doi:10.1186/1476-9255-12-S1-O8

Cite this article as: Campbell: Translating research flow cytometry assays for characterization of cellular therapeutics. *Journal of Inflammation* 2015 **12**(Suppl 1):O8.

Submit your next manuscript to BioMed Central and take full advantage of:

- Convenient online submission
- Thorough peer review
- No space constraints or color figure charges
- Immediate publication on acceptance
- Inclusion in PubMed, CAS, Scopus and Google Scholar
- Research which is freely available for redistribution

Submit your manuscript at
www.biomedcentral.com/submit



Correspondence: johncampbell3@nhs.net
Research, Development & Innovation, Scottish National Blood Transfusion Service (SNBTS), Edinburgh EH17 7QT, UK



© 2015 Campbell; licensee BioMed Central Ltd. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The Creative Commons Public Domain Dedication waiver (<http://creativecommons.org/publicdomain/zero/1.0/>) applies to the data made available in this article, unless otherwise stated.