# Dendritic Cells – Technology Overview

## Differentiated Dendritic Cells derived from CD14$^+$ Monocytes

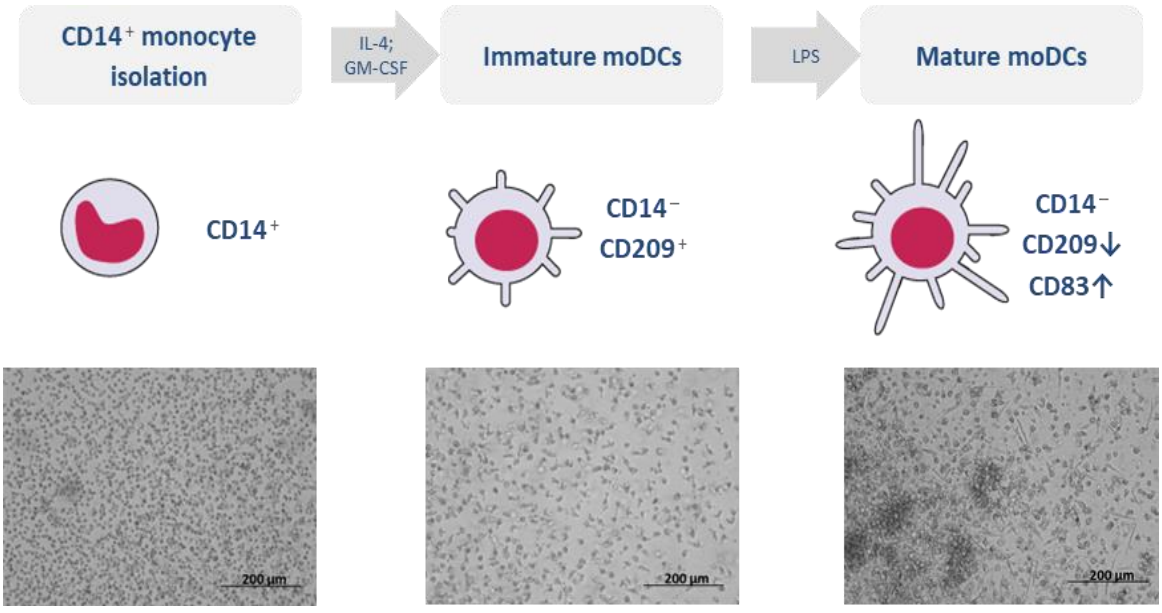
### Product overview

AvantiCell Science (ACS) derives immature dendritic cells (DCs) from CD14$^+$ monocytes obtained from human blood samples with full ethical permission.

Monocyte derived DCs (moDCs) are generated following 6 days' culture of CD14$^+$ monocytes with granulocyte-macrophage colony-stimulating factor (GM-CSF), and interleukin 4 (IL-4).

Cells are characterised by fluorescence-activated flow cytometry, cytokine induction and cell health indices, banked using ACS cryopreservation technology and stored at -150$^o$C.

DCs are antigen presenting cells that can initiate and modulate immune responses depending on their maturation status and the cytokine micro-environment. Immature DCs are derived from CD14$^+$ monocytes via cytokine induction with IL-4 and GM-CSF for 6 days, while mature DC are derived following an additional 24 hours in the presence of the bacterial-derived antigen lipopolysaccharide (LPS).



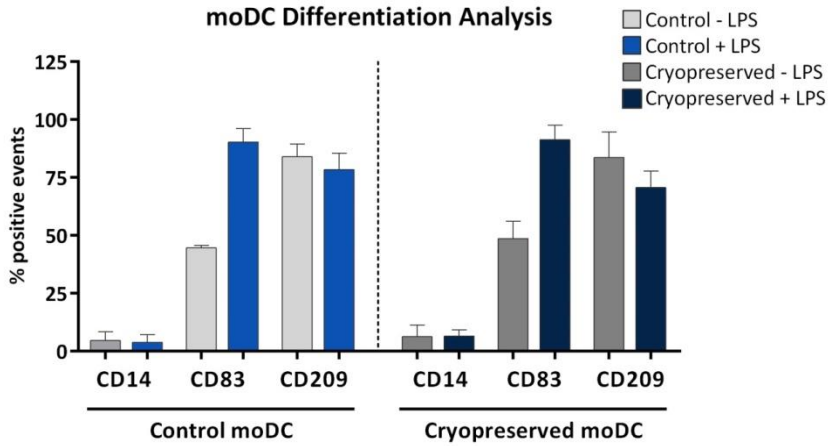

***Immature moDCs are derived from CD14$^+$ monocytes via IL-4/GM-CSF induced differentiation.***

moDCs undergo a number of morphological, phenotypic and functional changes during maturation. The formation of dendrites can be observed, as well as a down-regulation of cell surface marker CD209 and upregulation of CD83. Secretion of chemokines and cytokines, such as TNFα, IL-6 are also upregulated upon LPS stimulation and maturation.

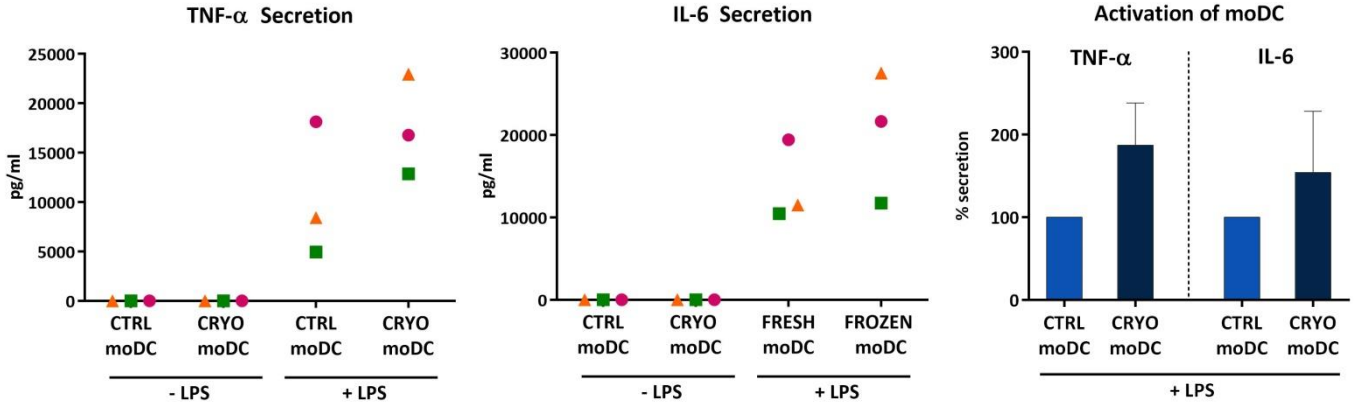
*In vivo*, immature DCs are recruited to sites of inflammation in peripheral tissues and capture antigens by phagocytosis and endocytosis. Internalisation of foreign antigens subsequently trigger immature DC maturation. DCs are also involved in antigen presentation and trigger processes which promote T cell activation.

Immature moDC are frozen and banked via ACS cryopreservation technology and stored at -150°C prior to shipping. Upon thawing, immature moDCs should be cultured in ACS plating medium for 24hr, after which cells may be matured as required for customer specific use (e.g. LPS for 24hr).

Cryopreserved cell viability after recovery into culture is >90% and DC marker status is comparable to non-cryopreserved after the same differentiation stimulation. Cytokine induction profiles are also well maintained in the cryopreserved samples.




***Surface marker expression of immature and mature moDCs derived from cryopreserved immature moDCs is comparable*.**




***Cytokine secretion and activation of fresh and cryopreserved moDCs is maintained.***