

# DIFFERENTIATION PROTOCOL FOR RA-DEPENDENT HEMATOPOIETIC PROGENITOR CELLS

[Luff, Stephanie, Sturgeon, Christopher](#)

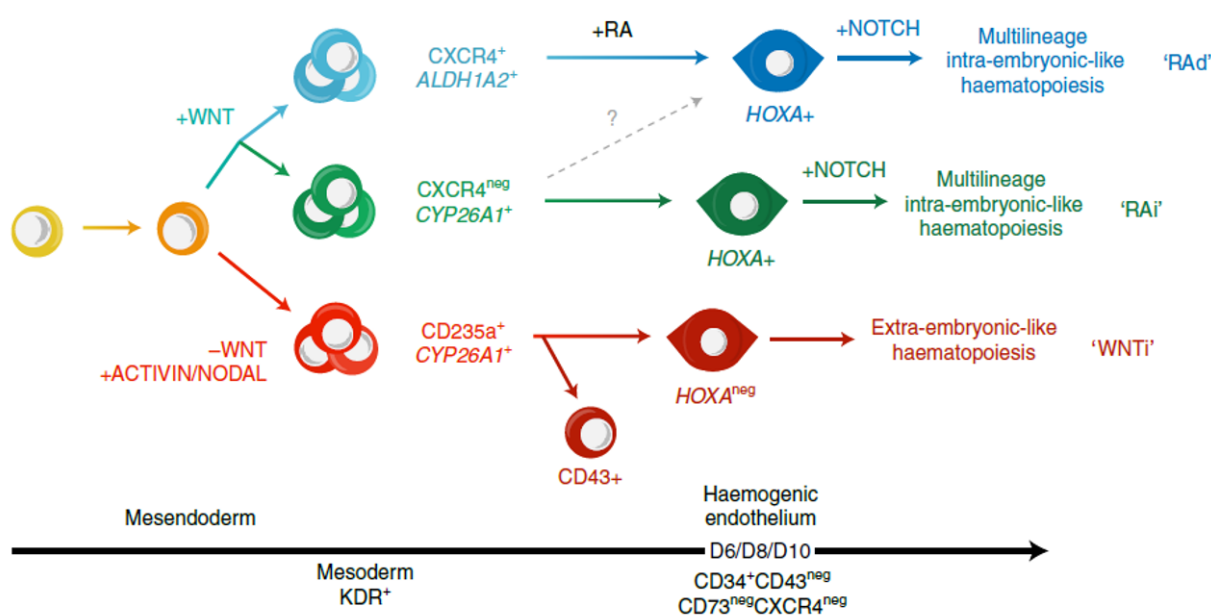
[Miller, Qian](#)

T-018886

## Technology Description

Researchers in Chris Sturgeon’s lab at Washington University have developed a protocol for definitive differentiation of hematopoietic progenitor cells that can be used to develop replacement blood products. This protocol involves a sequential, time-sensitive manipulation of BMP4, bFGF, WNT, Activin/Nodal and retinoic acid (RA) signaling.

The differentiation protocol is highly specific; for instance, cells treated with RA one or two days late will lack the hematopoietic potential while still expressing the same surface markers. However, it enables the production *in vitro* of replacement blood products and off-the-shelf immunotherapies.



## Stage of Research

The researchers have established an *in vitro* differentiation protocol that results in definitive hematopoietic progenitor cells capable of hematopoiesis. This protocol has then been used to differentiate tissue resident macrophages for further study.

## Publications

- Dege C, Sturgeon CM. (2017). [Directed differentiation of primitive and definitive hematopoietic progenitors from human pluripotent stem cells](#). *Journal of Visualized Experiments*, 129: 55196.
- Bredemeyer AL, Amrute JM, Koenig AL, Idol RA, ... Lavine KJ. (2022). [Derivation of extra-embryonic and intra-embryonic macrophage lineages from human pluripotent stem cells](#). *Development*, 200016.

## Applications

- Replacement blood products
- Off-the-shelf immunotherapy

## Key Advantages

- Produces progenitor cells capable of hematopoiesis
- Enables synthesis of blood products from pluripotent stem cells

**Patents:** [US20220025330](#)

**Related Web Links:** Sturgeon [Profile](#)