

# Producing T cell competent blood progenitor cells from pluripotent stem cells in scalable dynamic suspension culture

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## Summary

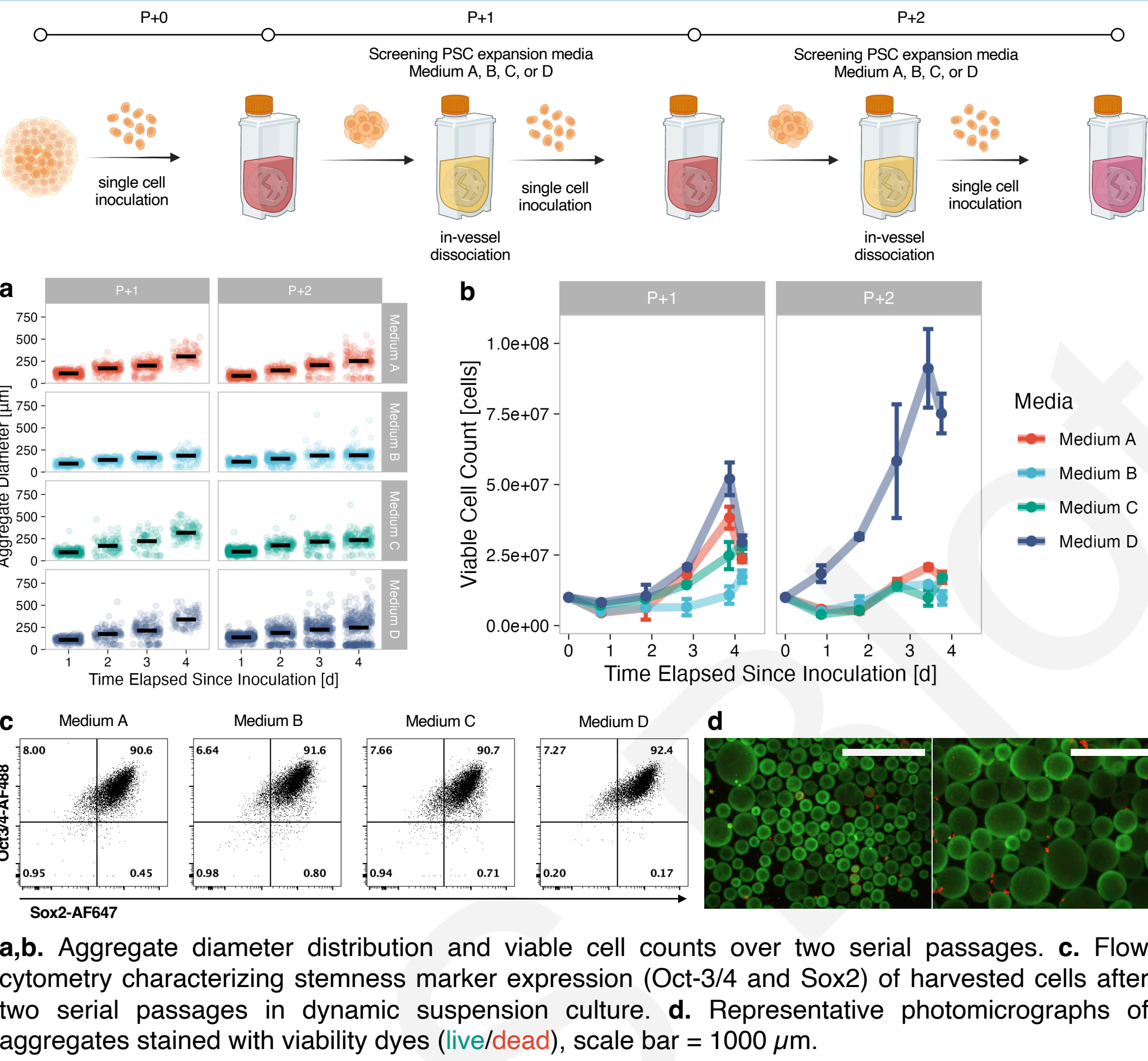
### INTRODUCTION

- i. Scaled-up bioprocesses will drive down the cost of pluripotent stem cell (PSC) derived T cell therapies
- ii. Current vein-to-vein model of T cell therapies are inaccessible, highly variable, and costly
- iii. Our capability to differentiate PSCs into blood progenitor cells with T lymphoid-competence provides an opportunity to leverage PSCs as an alternative source of T cell immunotherapies
- iv. A key challenge to enabling scalable cell manufacturing is the reliance on low-throughput microplate based adherent cultures

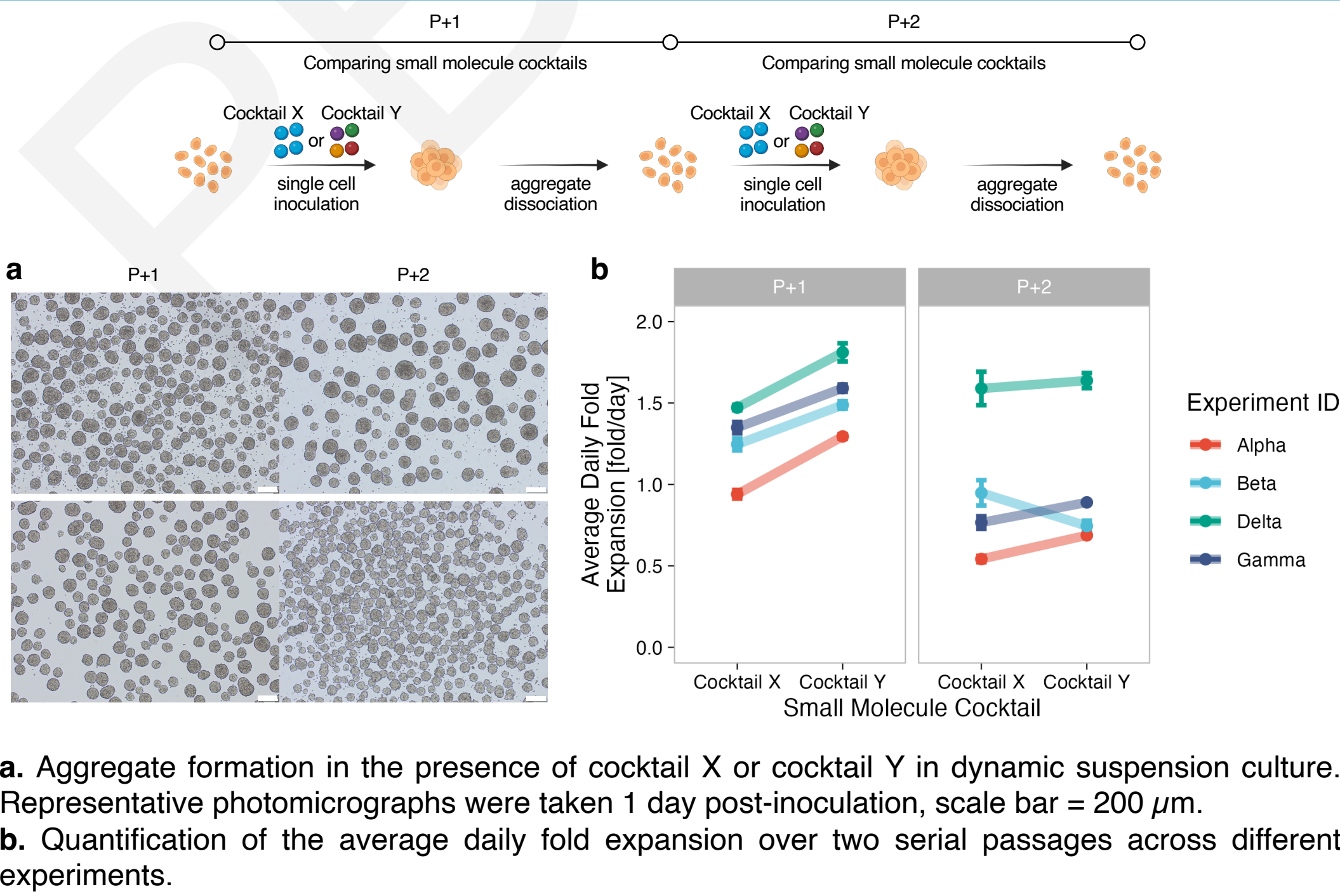
### RESULTS

1. We identified commercially available PSC expansion media that is compatible with single-cell passaging and maintains stemness in dynamic suspension-based culture
2. We tested an alternative small-molecule cocktail to intensify PSC expansion and differentiation toward blood and immune cell lineages
3. We designed a scalable dynamic suspension culture-based bioprocess for blood progenitor cell production that eliminates *ex situ* CD34+ enrichment and exogenous notch ligands
4. We show that generated blood progenitor cells exhibit T lymphoid-competence

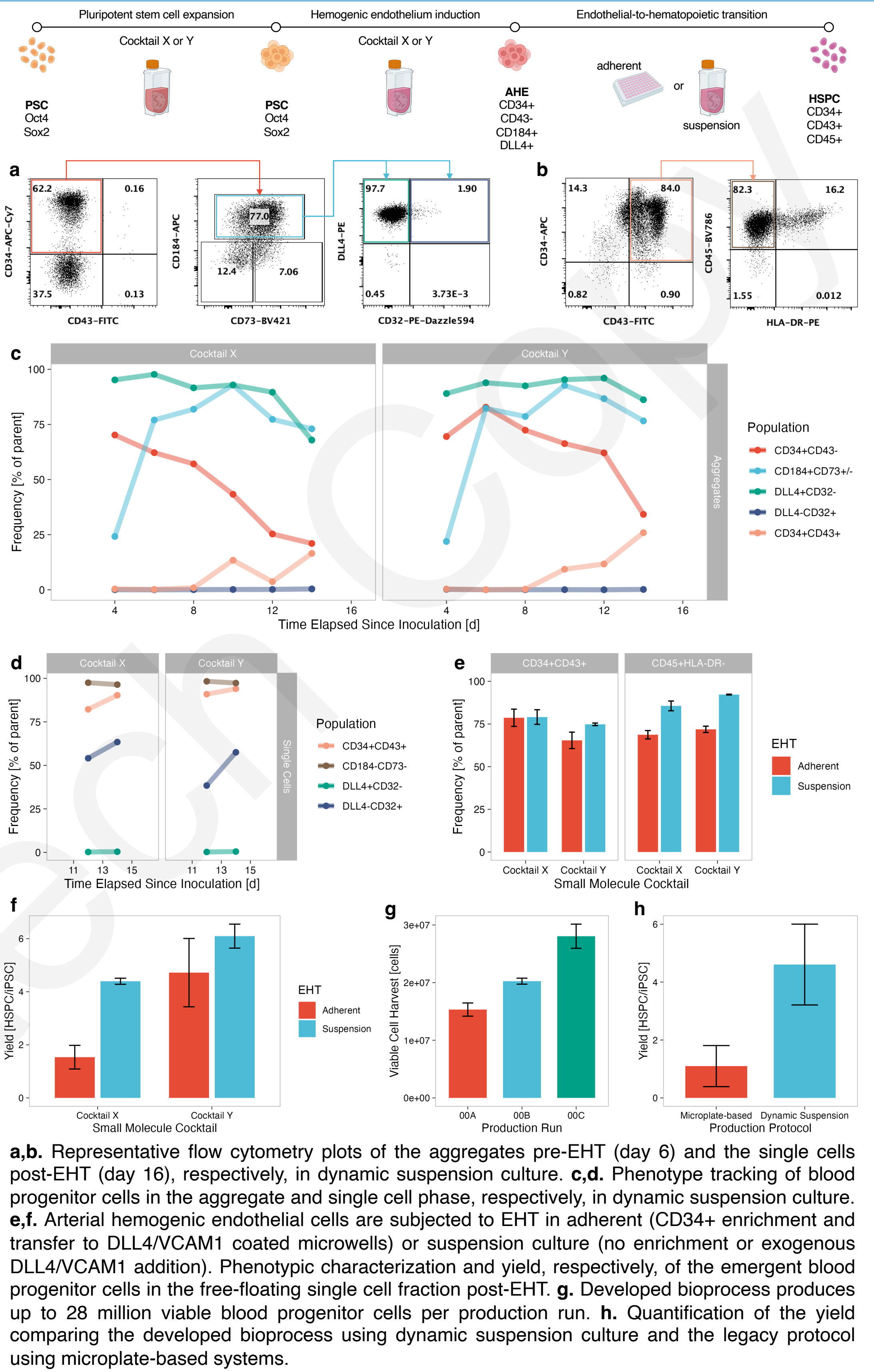
## 1. Screening commercially available media to maximize PSC expansion in dynamic suspension culture



## 2. Priming with cocktail Y in dynamic culture supports aggregate formation and increases daily fold expansion



## 3. Developed bioprocess allows endothelial-to-hematopoietic transition in a scalable manner



## 4. Generated blood progenitor cells exhibit T lymphoid-competence

