

Vascularized human bone marrow niches in perfusion bioreactors for disease modelling

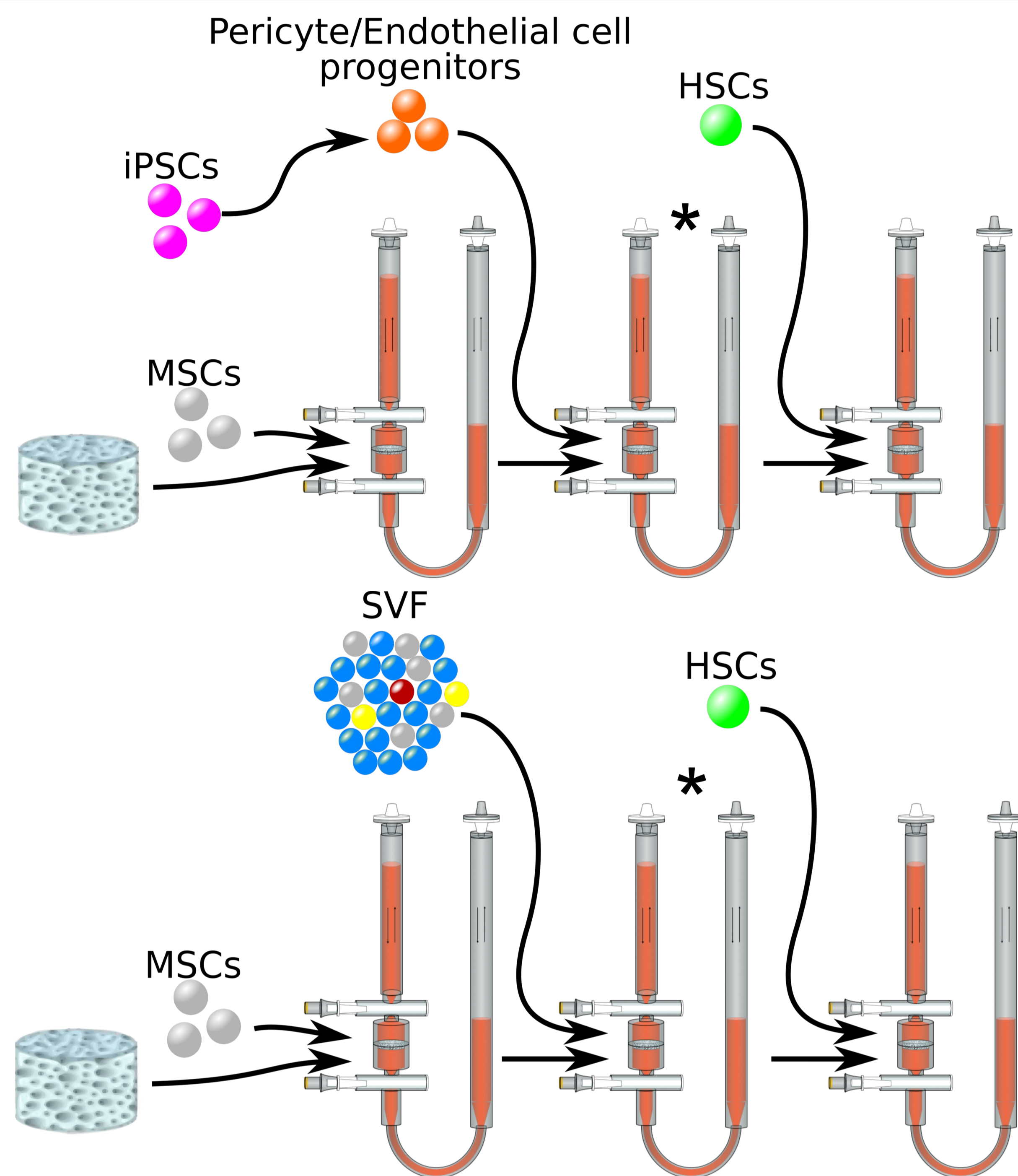
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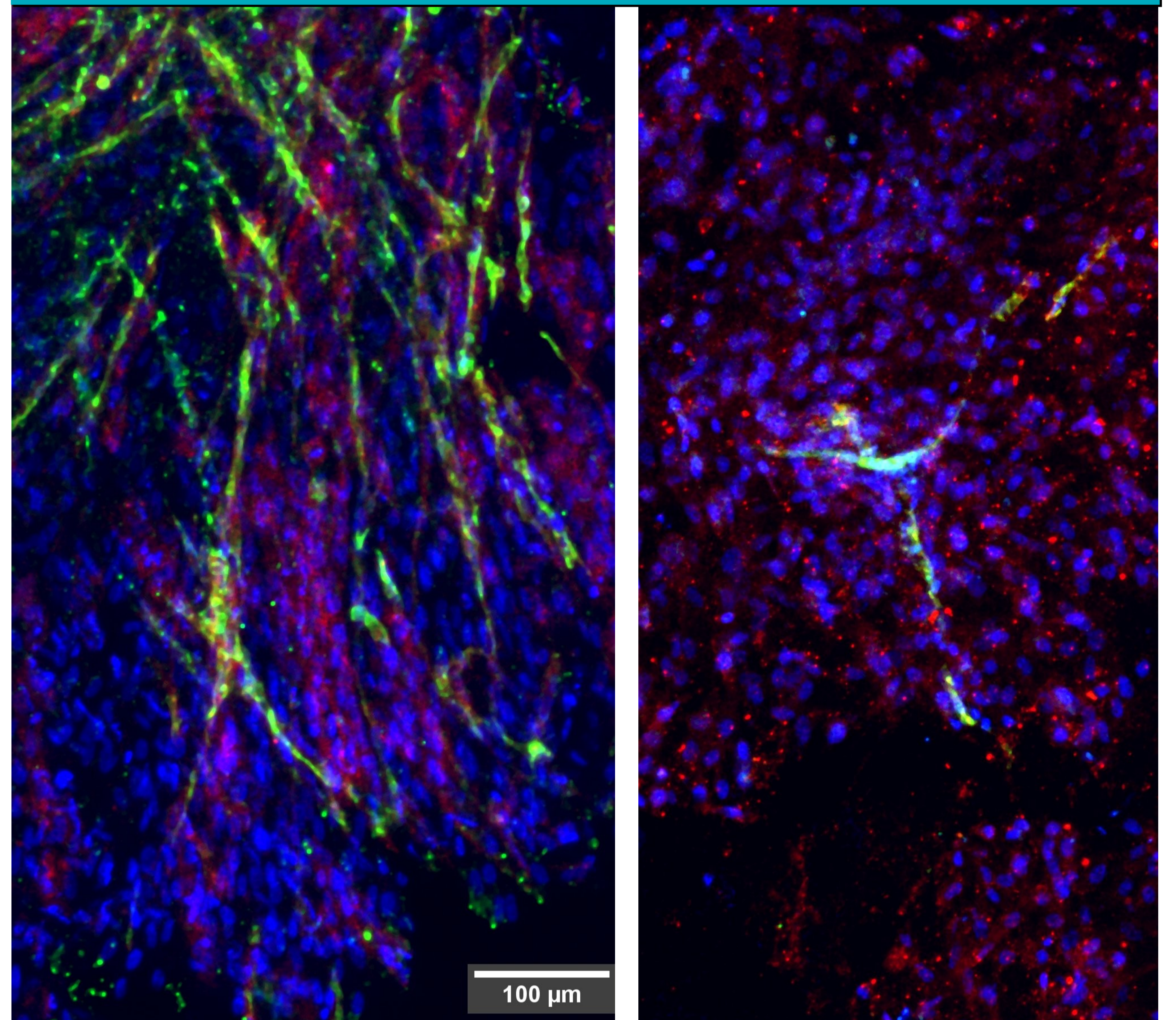
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Goal: Generate vascularized bone marrow environment
Approach: Using MSCs to remodel a scaffold under perfusion into an environment enabling vascular growth via SVF or iPSC derived cells to study healthy hematopoiesis and their malignant counterpart



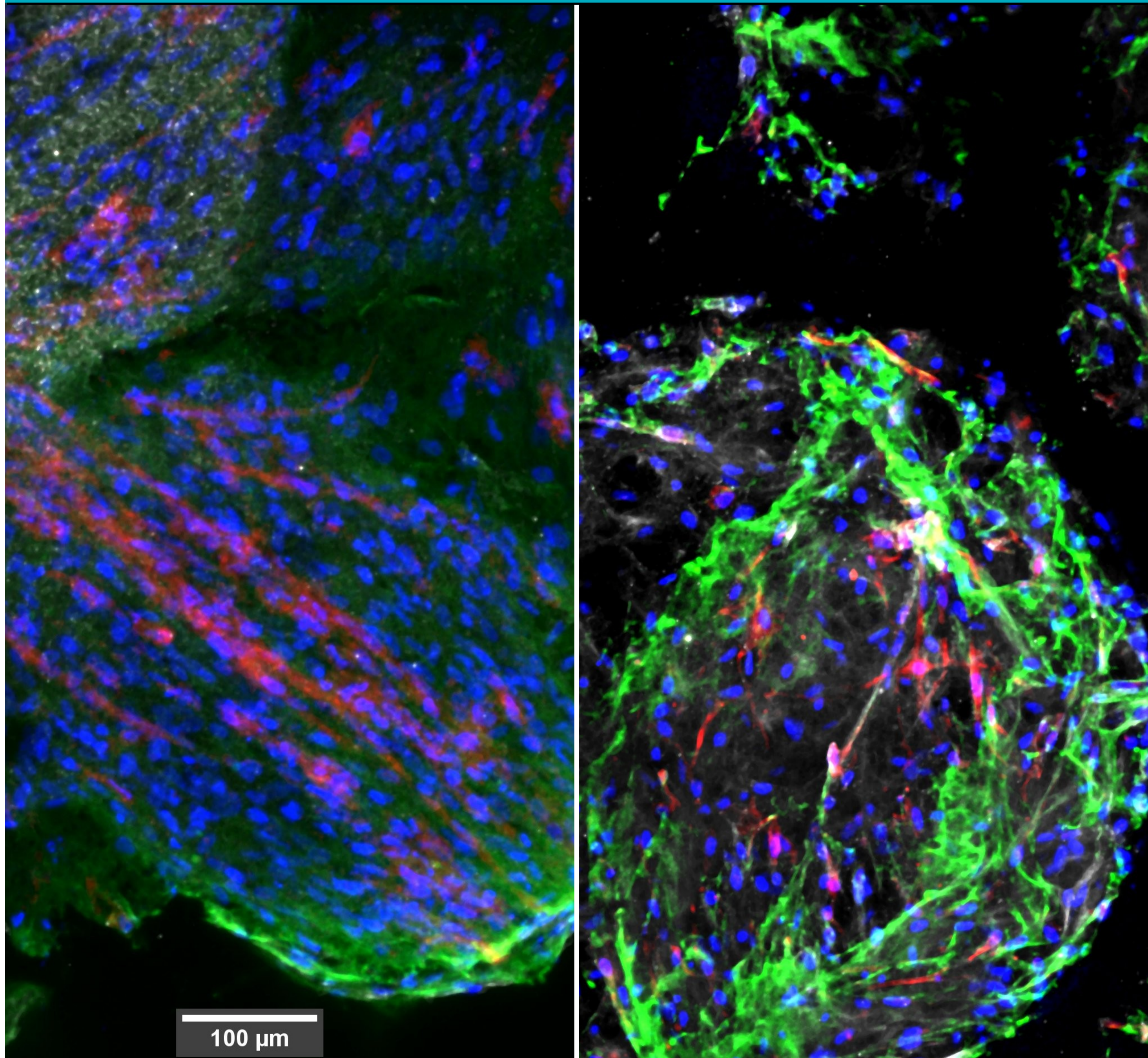
Vital tissue after 28 days and formation of vascular structures by co-cultures on ceramic scaffold MSCs with:
Pericyte/endothelial progenitors SVF



CD31 (Green)
RFP from iPSC derived cells (Red)
DAPI (Blue)

CD31 (Green)
VEGF (Red)
DAPI (Blue)

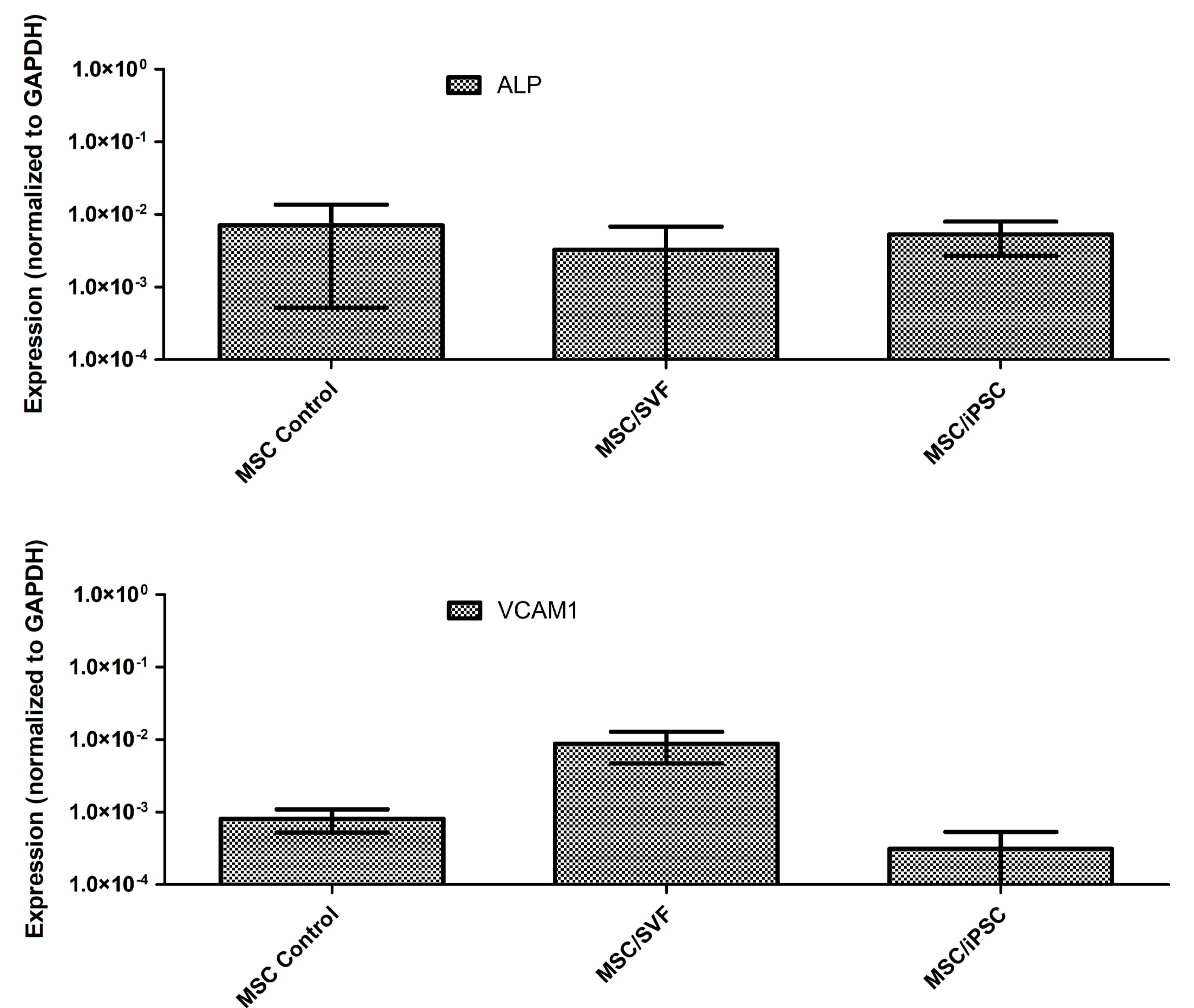
Osteogenic potential of MSCs in co-cultures seems unaffected
Pericyte/endothelial progenitors SVF



Col1 (Grey)
RFP from iPSC derived cells (Red)
OCN (Green)
DAPI (Blue)

Col1 (Grey)
SMA (Red)
OCN (Green)
DAPI (Blue)

Gene expression of osteogenic and vasculature markers



Conclusion: Both SVF and iPSC derived cells form vascularization in a co-culture with pre-seeded MSCs and don't significantly affect the osteogenic potential
Outlook: Currently ongoing experiment already introducing healthy HSCs to the vascularized niche, future experiments will include malignant HSCs