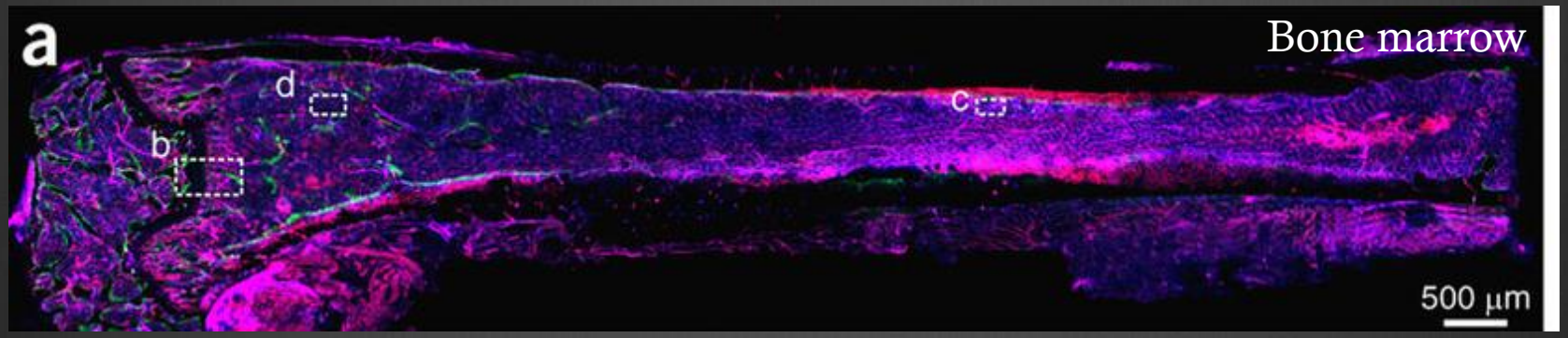
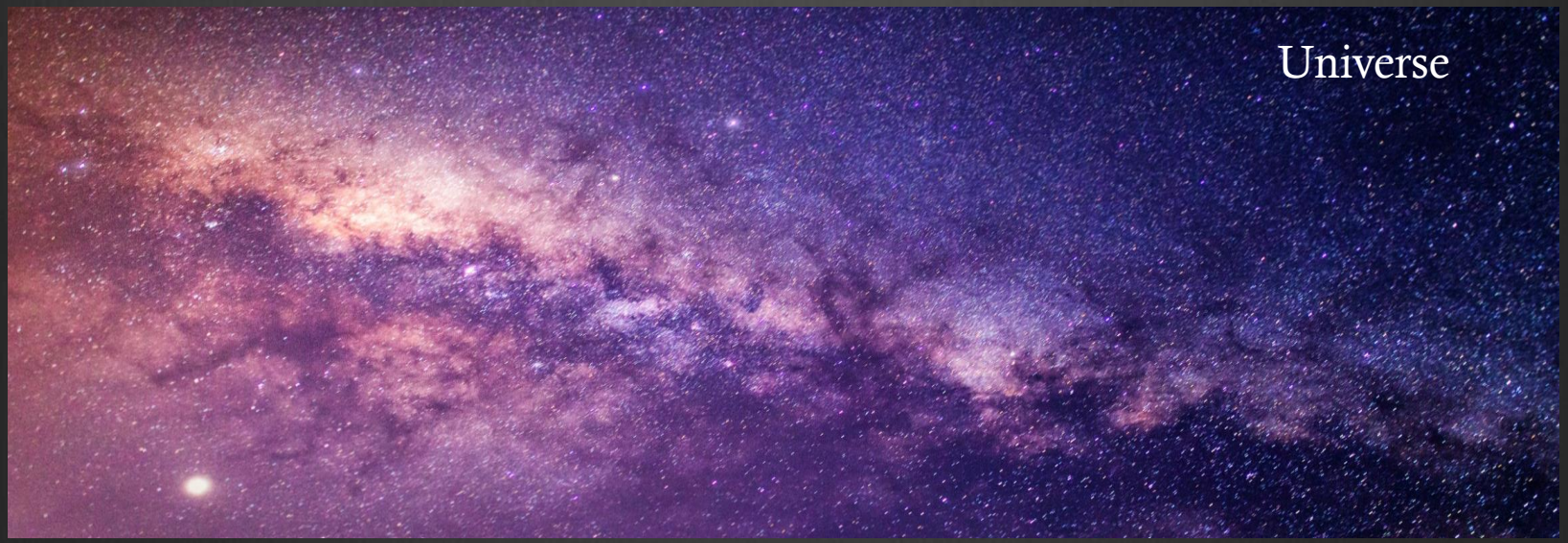
Focus on other cells and mechanisms in health and disease

Bone marrow microenvironment

Ioannis Mitroulis,MD, PhD

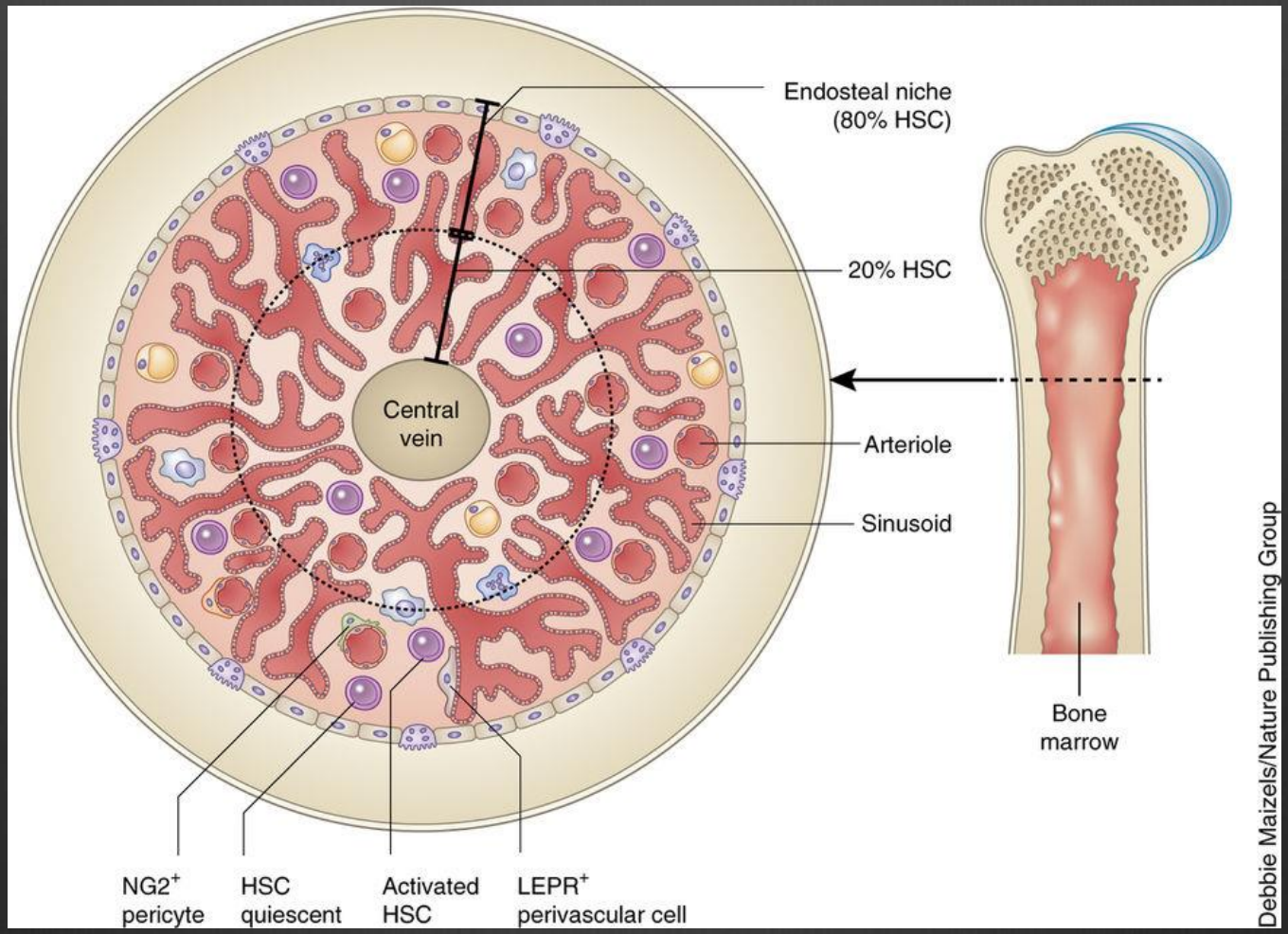


Bone marrow



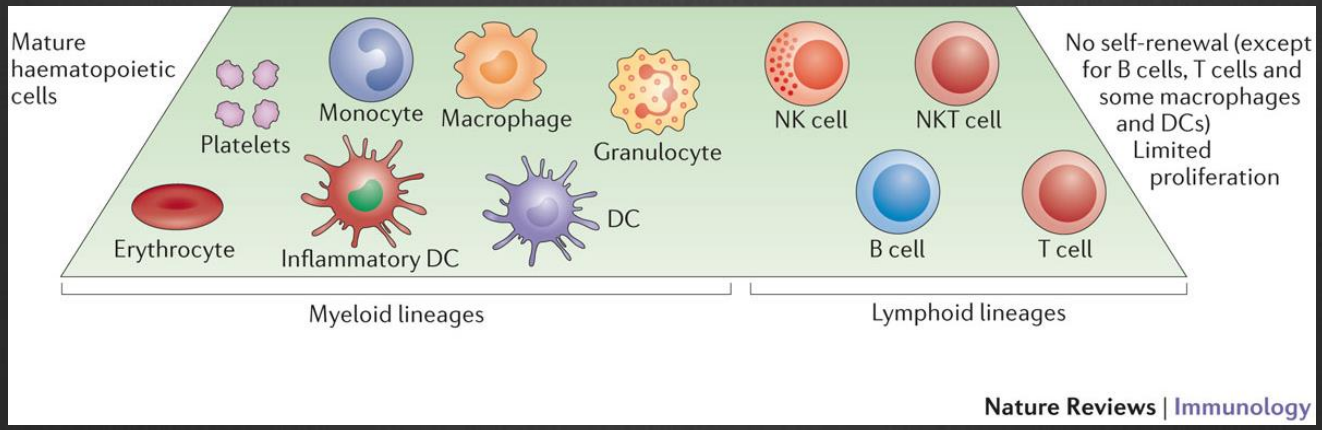
Universe

BM architercture



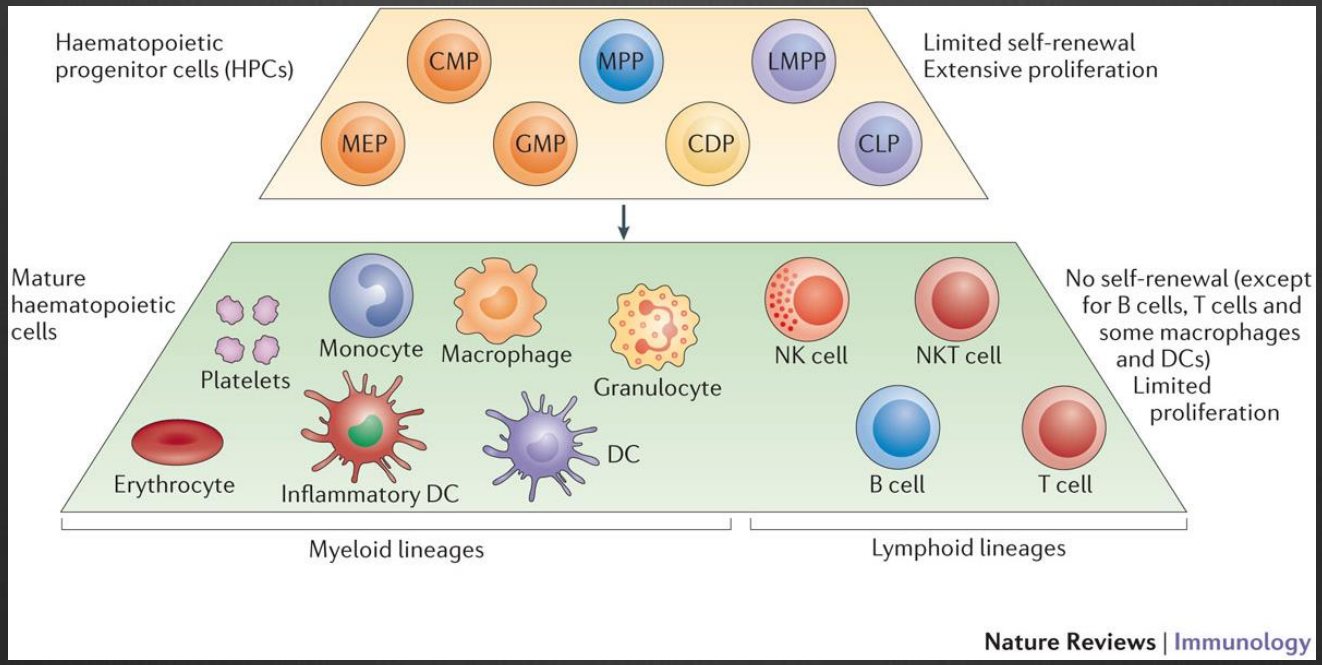
Mendelson and Frenette, Nat Med 2017

HSCs at the top of immune system



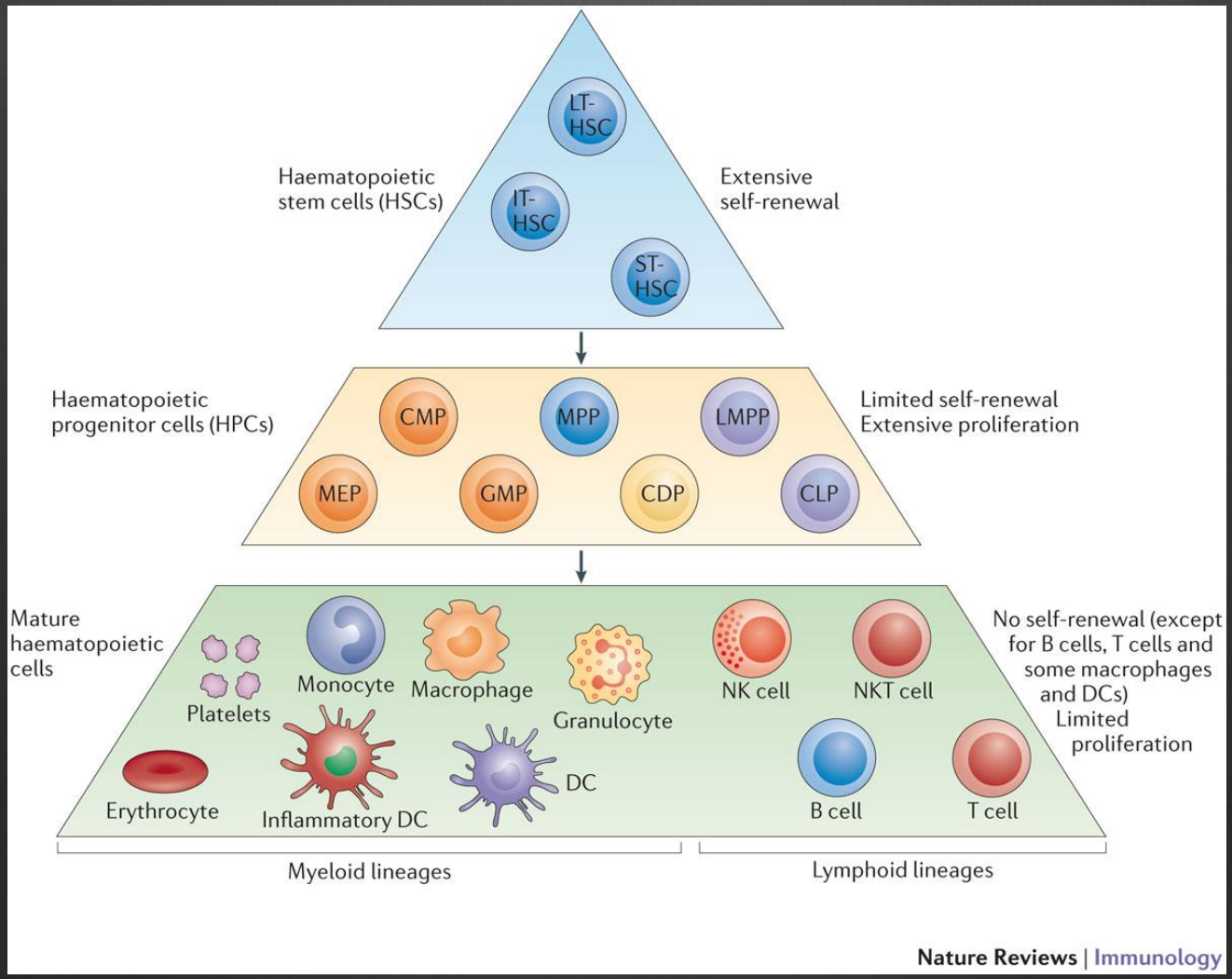
Manz and Boettcher, Nat Rev Immunol 2014

HSCs at the top of immune system



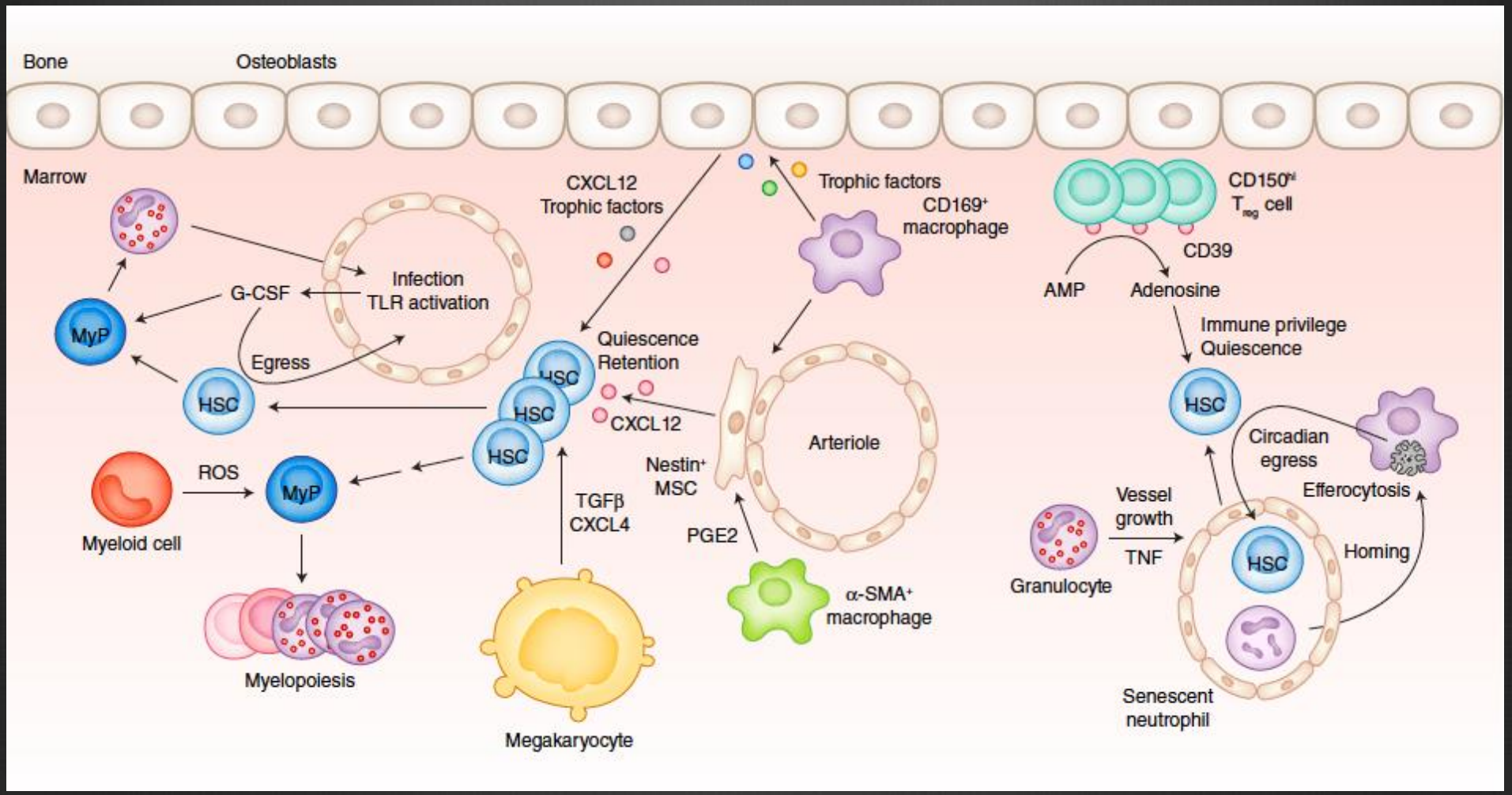
Manz and Boettcher, Nat Rev Immunol 2014

HSCs at the top of immune system



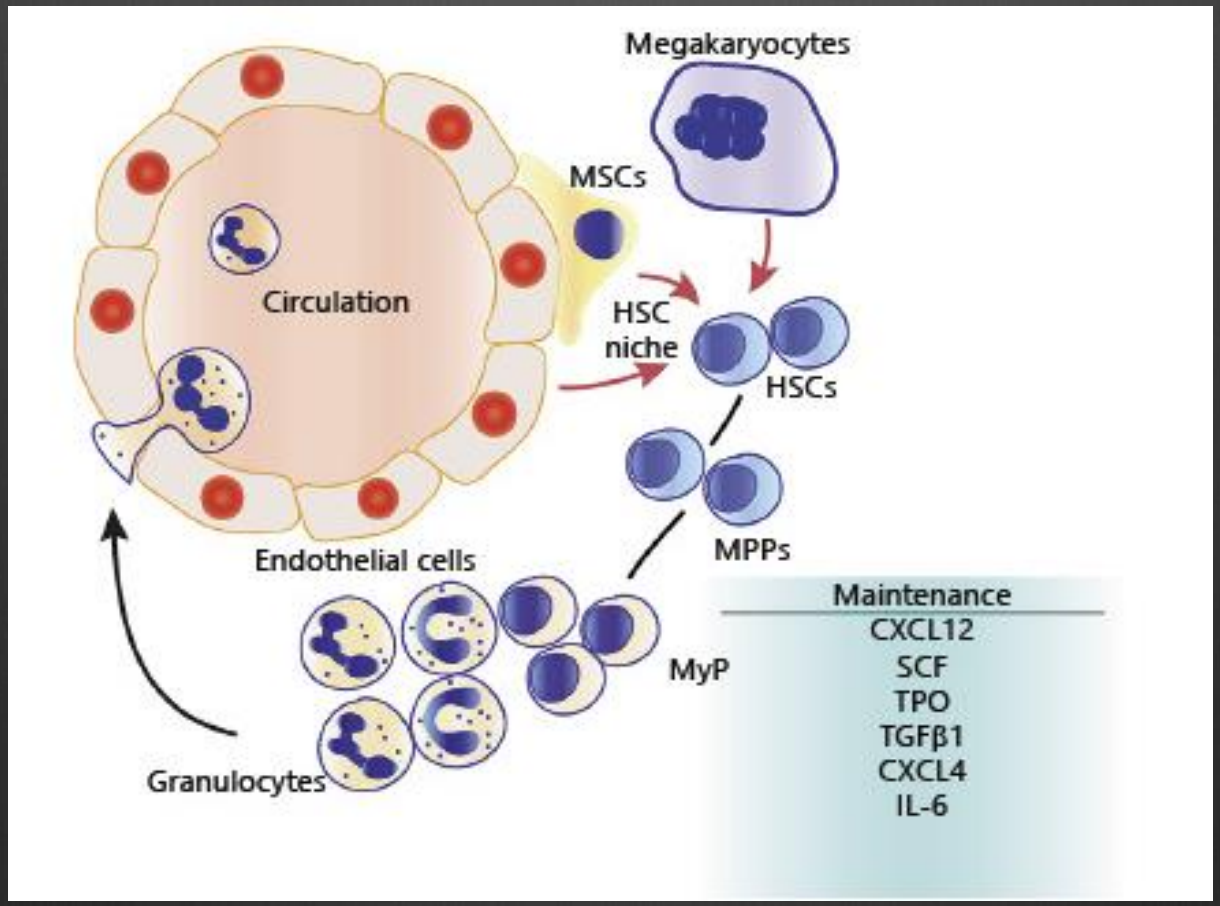
Manz and Boettcher, Nat Rev Immunol 2014

The adult bone marrow HSC niche.



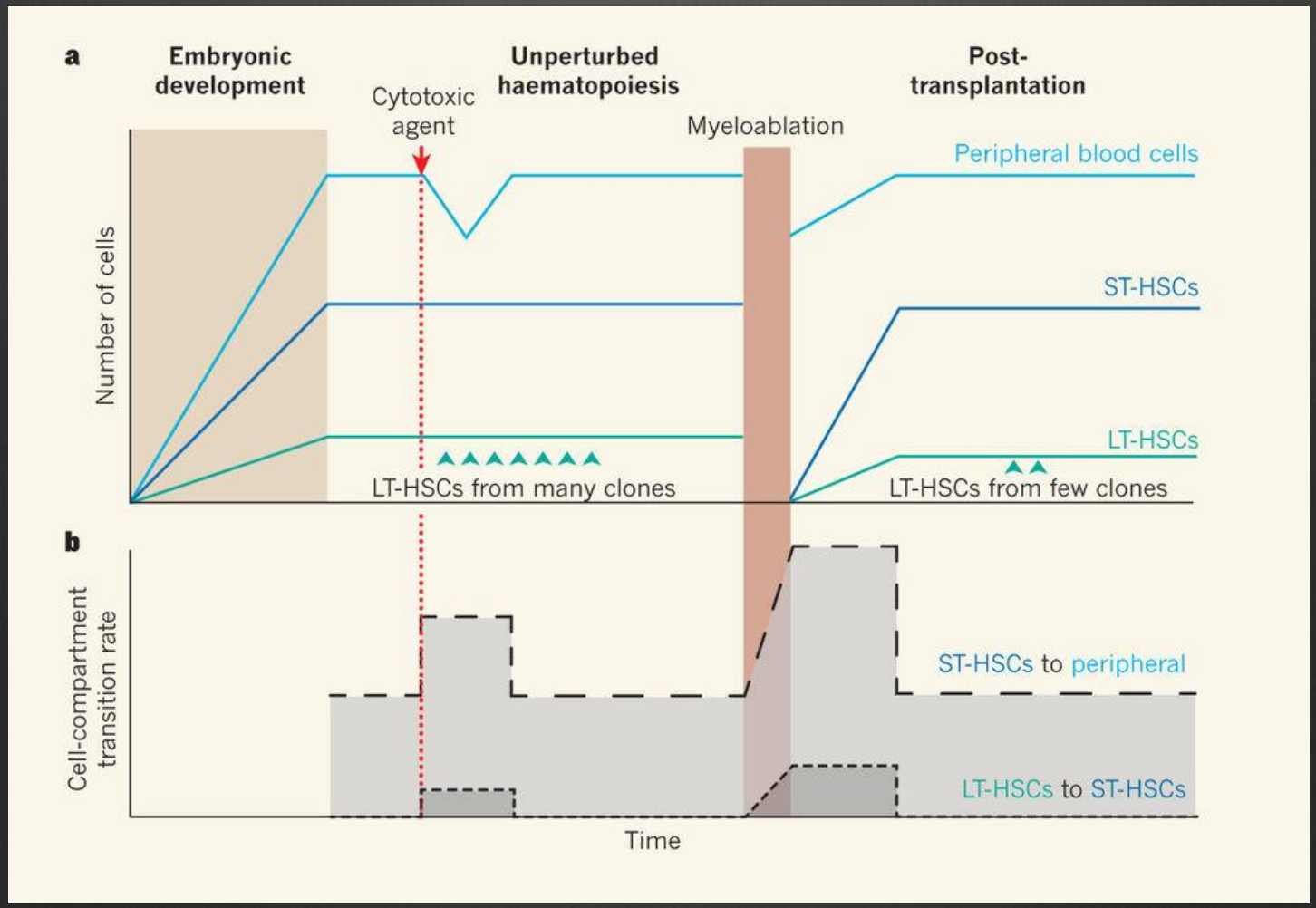
Chavakis, Mitroulis, Hajishengallis, Nat Immunol, 2019

Regulation of steady state myelopoiesis



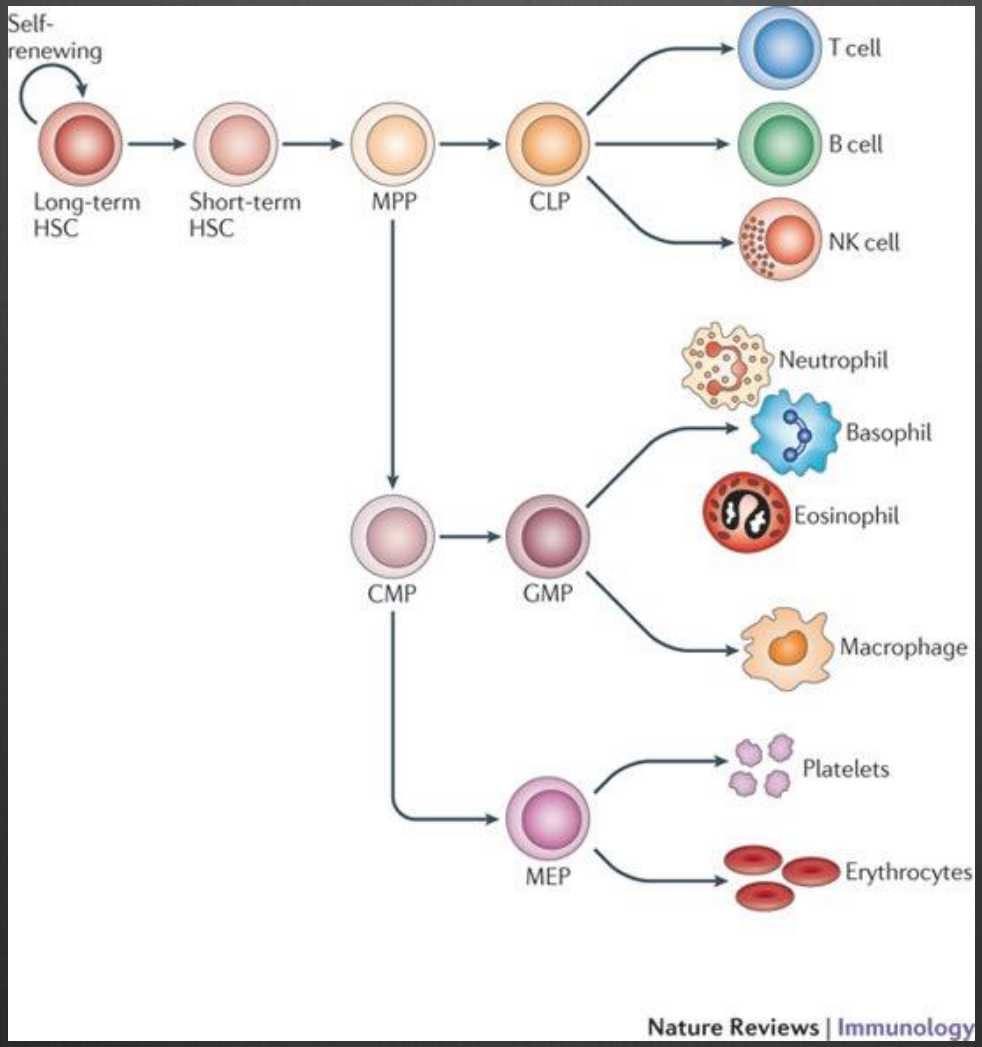
Mitroulis et al, J Innate Immunity, 2018

HSC in steady state vs stress hematopoiesis



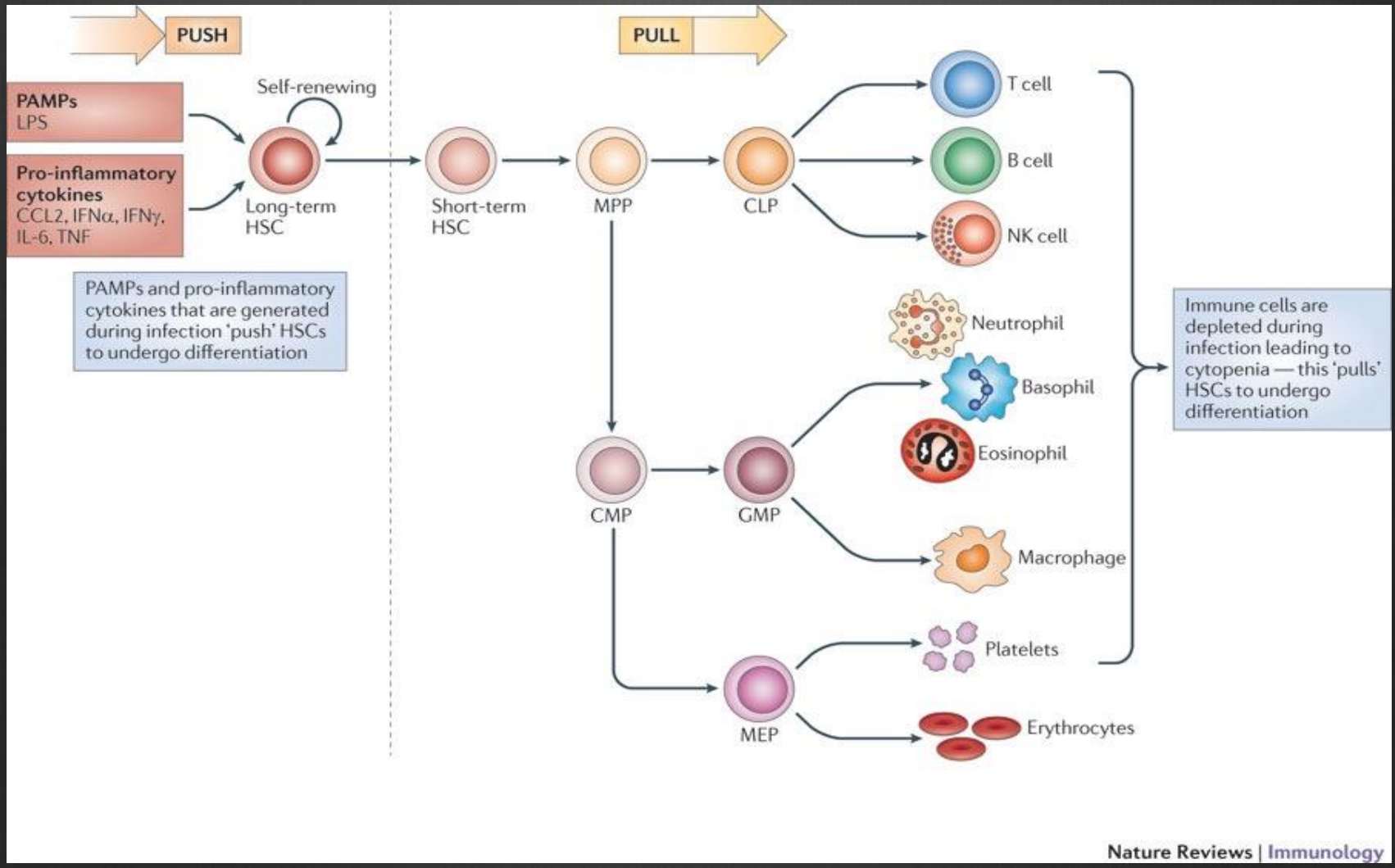
Busch et al, Nature 2014

HSC lineage differentiation



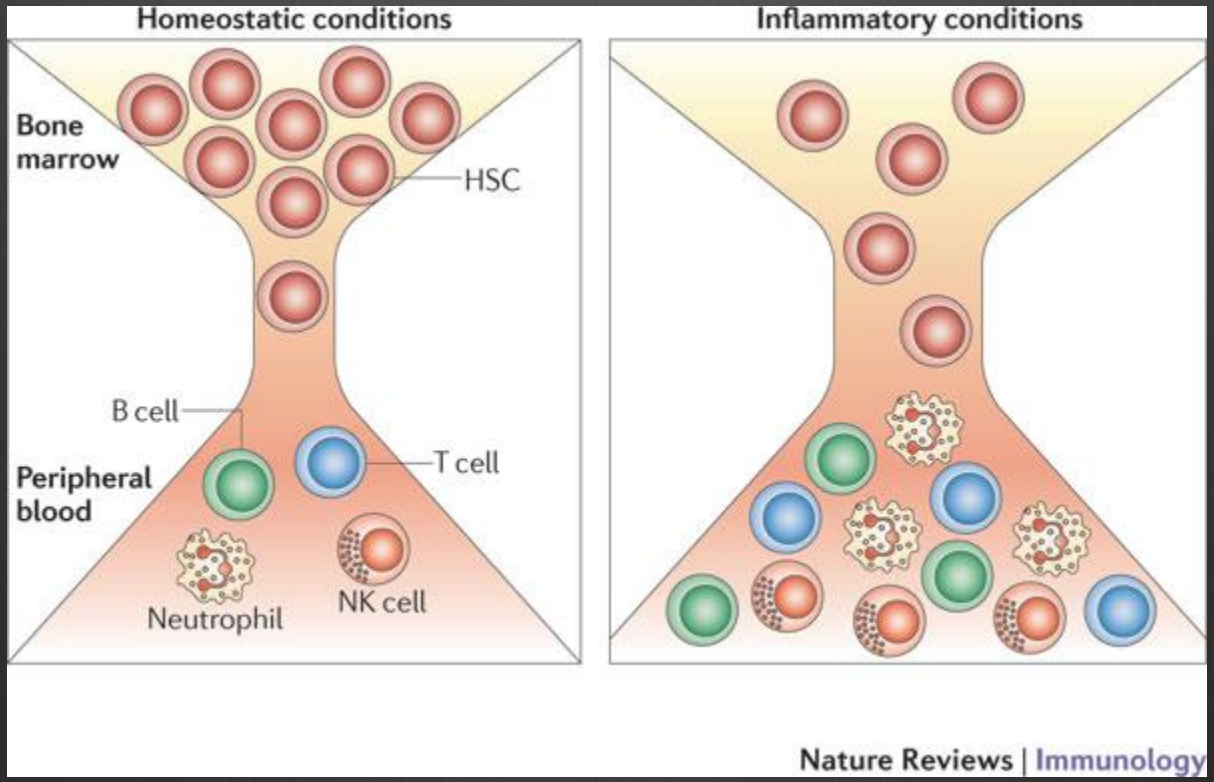
King KY and Goodell MA, Nature Reviews Immunology, 2014

Regeneration and hematopoietic stress; Direct activation vs depletion of mature cells



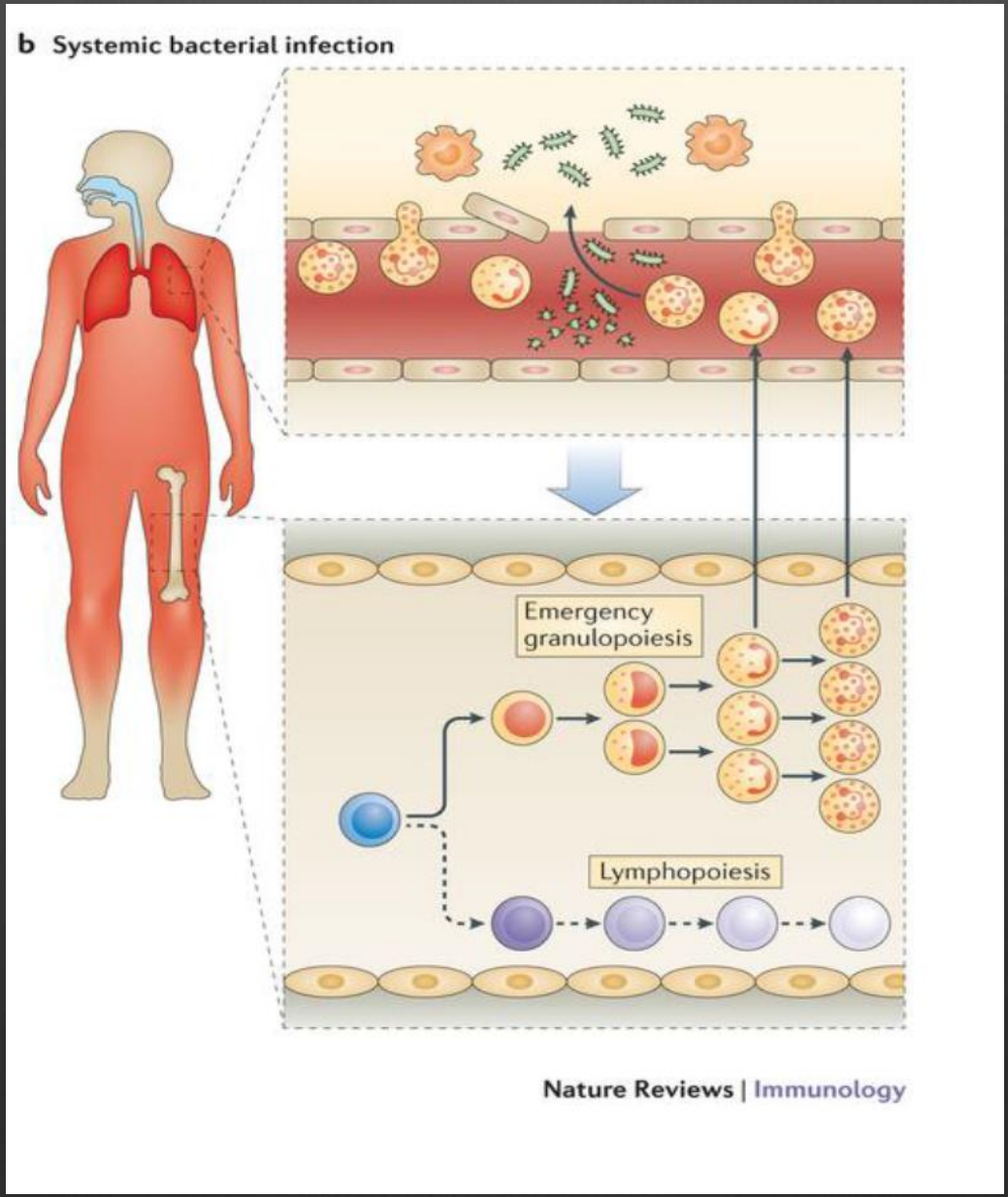
King KY, Goodell MA, Nature Reviews Immunology (2014)

HSCs and inflammation

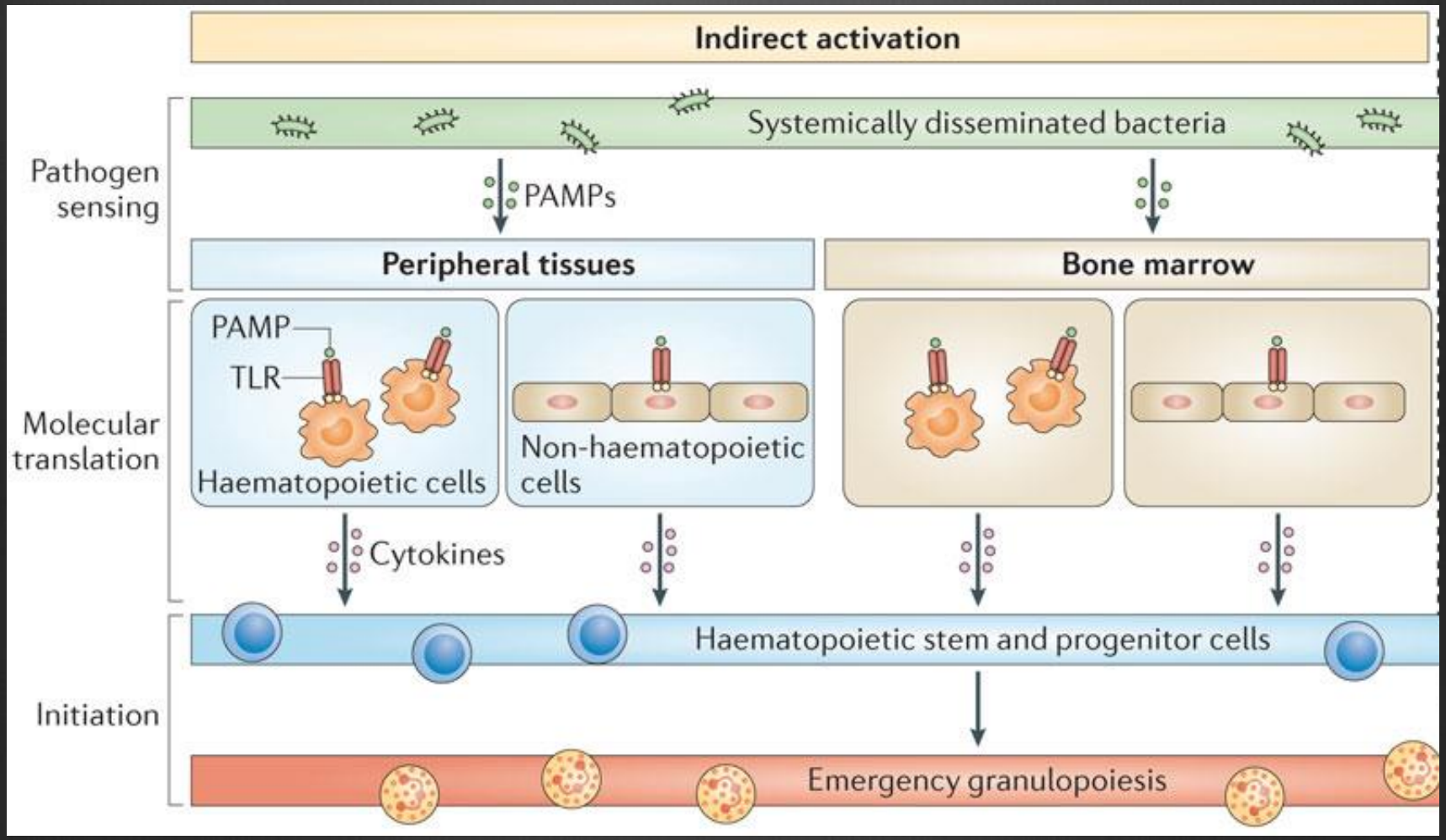


King KY and Goodell MA, Nature Reviews Immunology, 2014

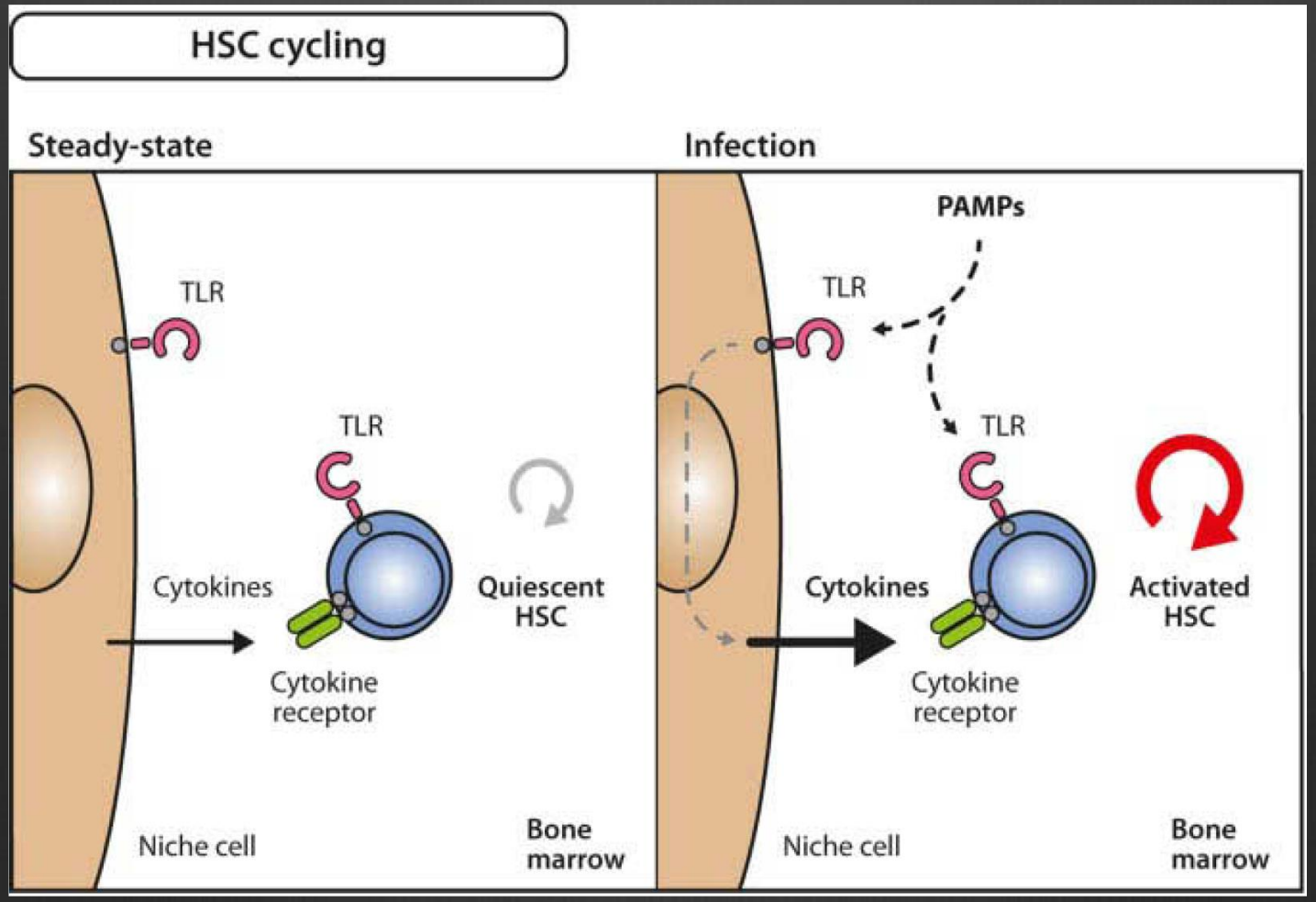
HSCs in systemic infection



HSCs in systemic infection

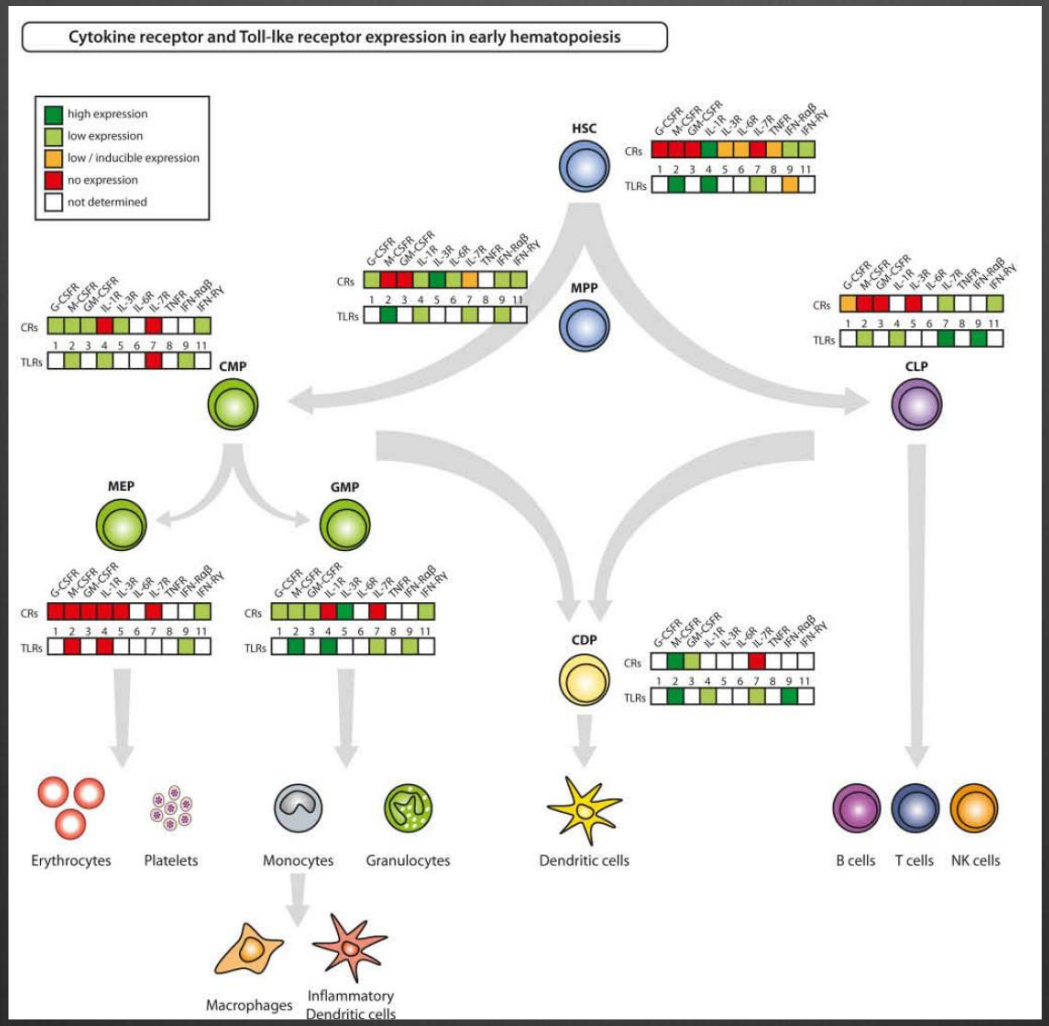


King KY and Goodell MA, Nature Reviews Immunology, 2014



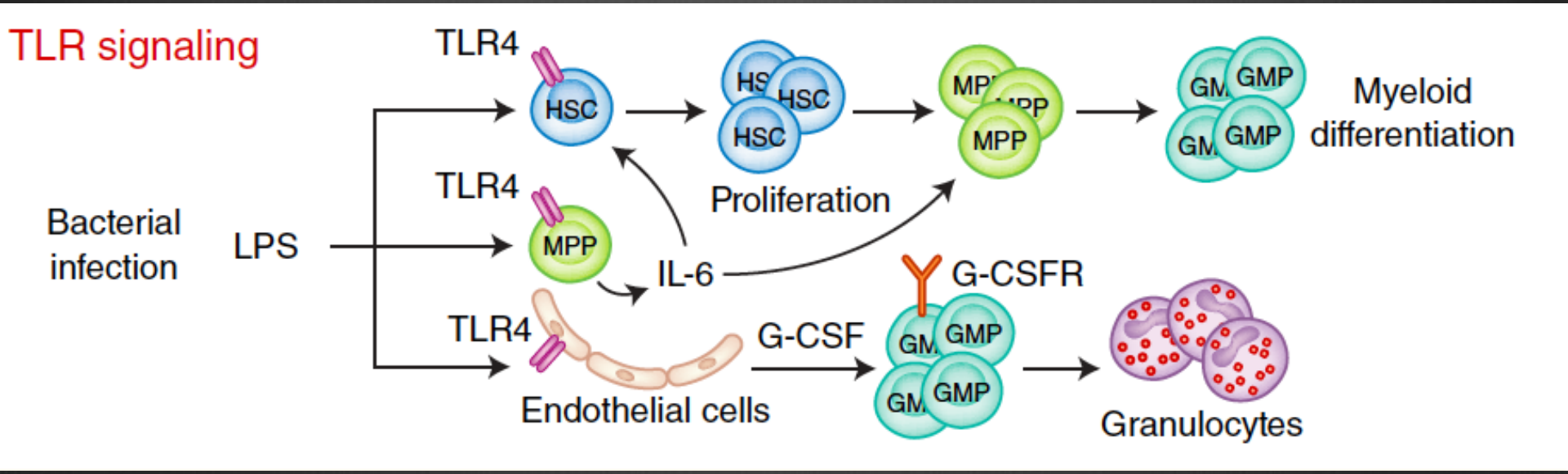
Takizawa et al, Blood 2012

Expression of cytokine receptors in progenitor cells



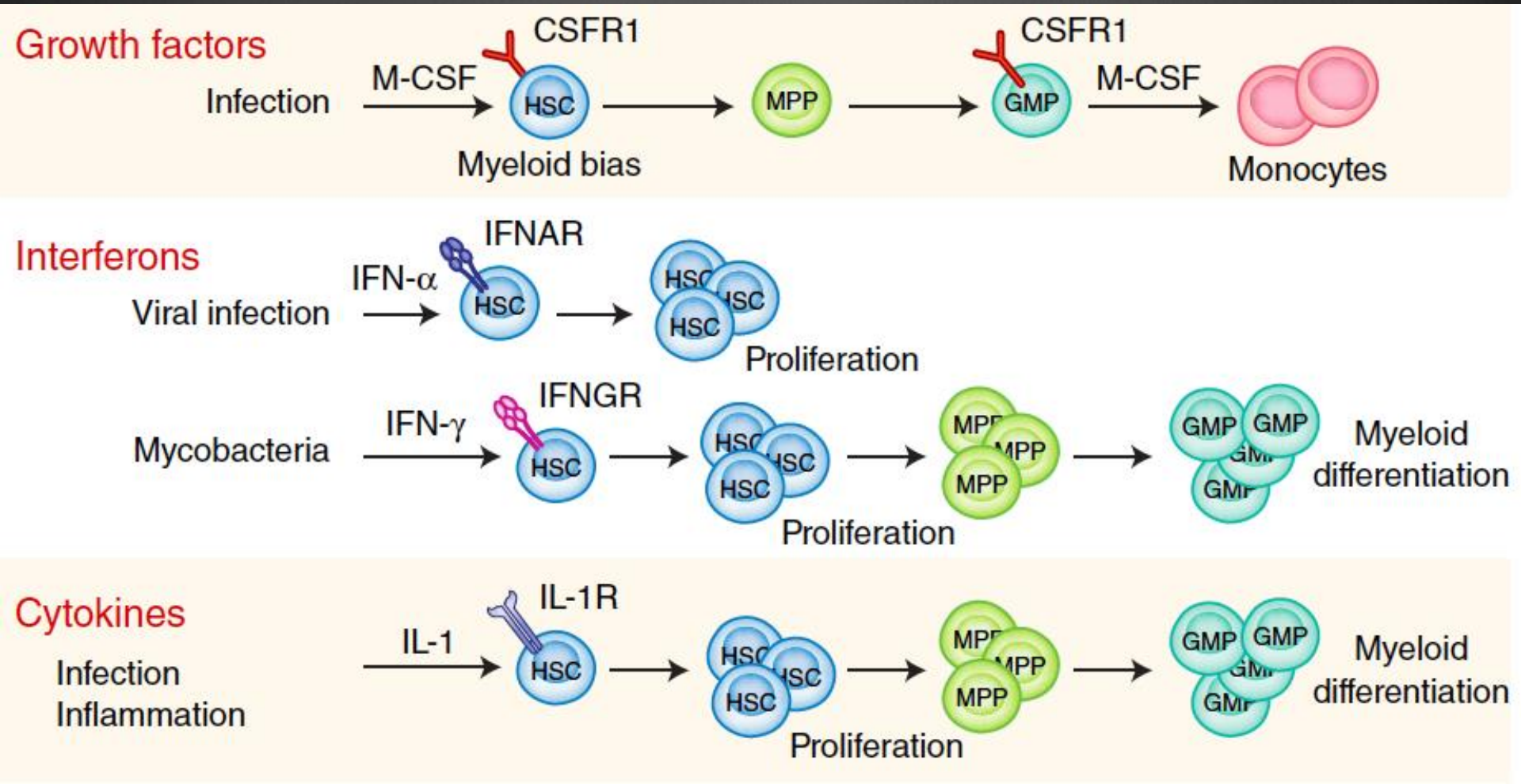
Takizawa et al, Blood 2012

Regulation of hematopoiesis by pathogen-derived signals



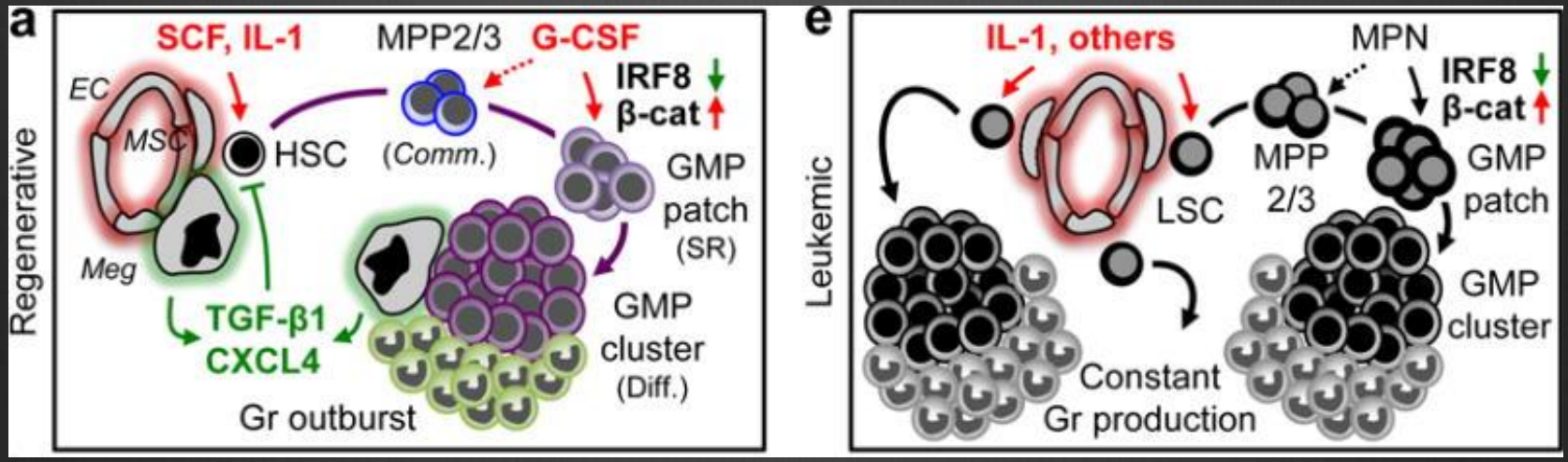
Chavakis, Mitroulis, Hajishengallis, Nat Immunol, 2019

Regulation of hematopoiesis by inflammatory signals



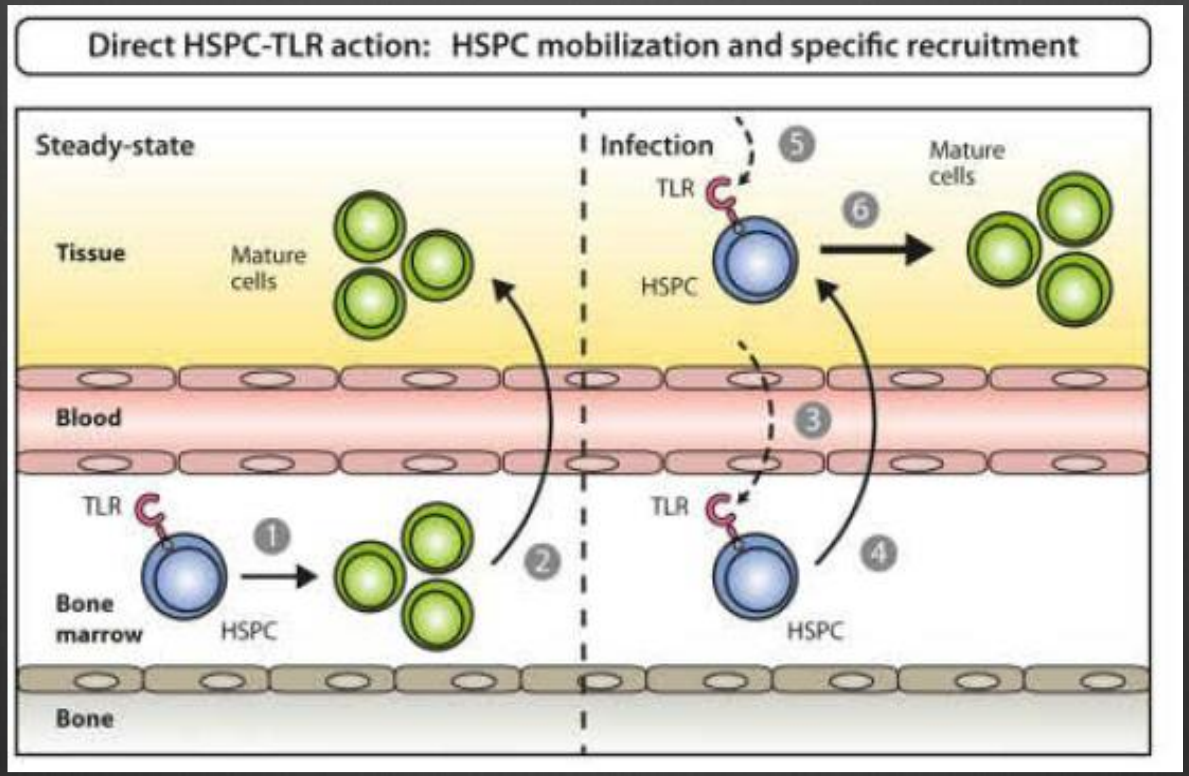
Chavakis, Mitroulis, Hajishengallis, Nat Immunol, 2019

Myeloid progenitors form clusters



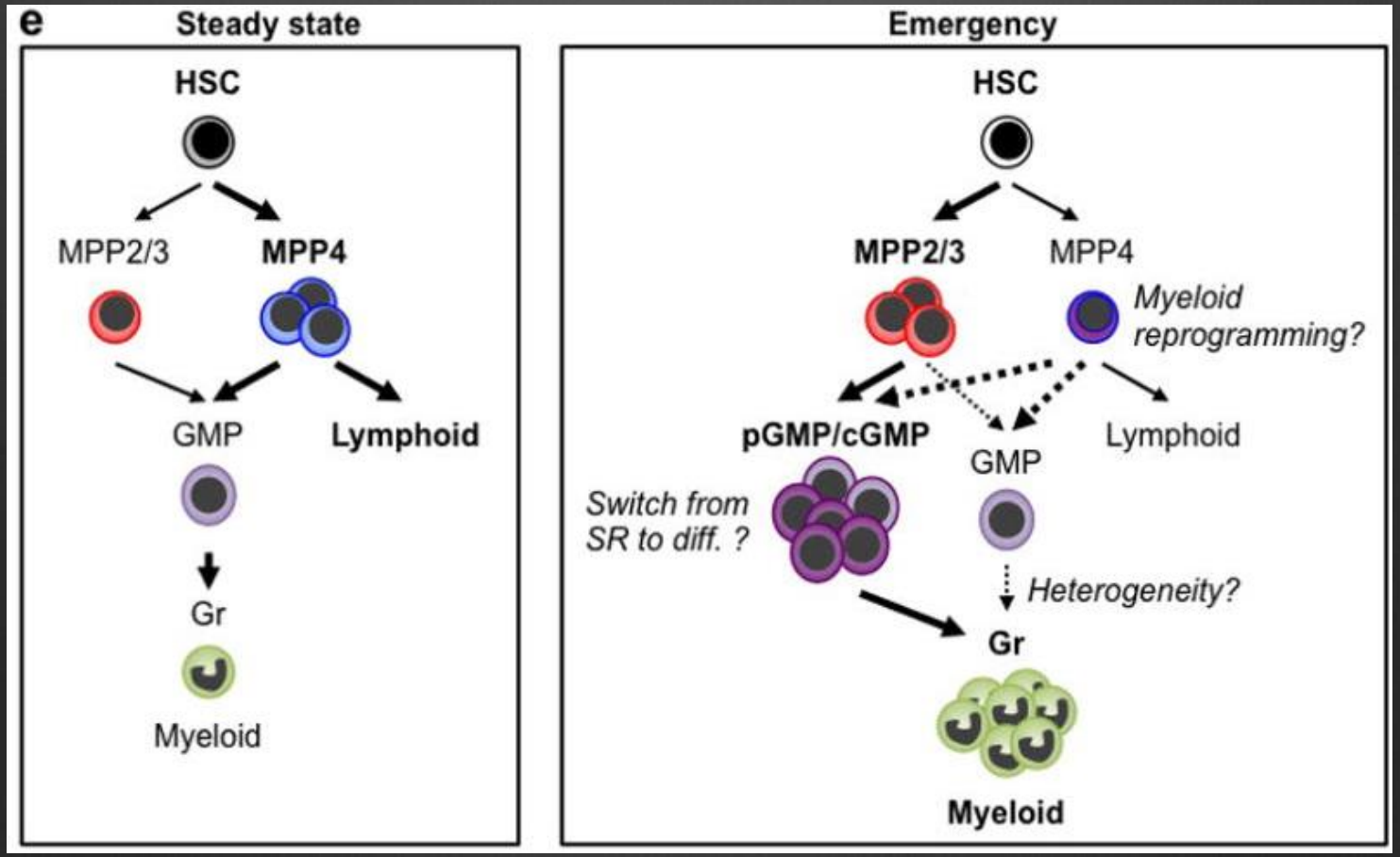
Herault et al, Nature 2017

Migration of HSCs in inflammed tissue



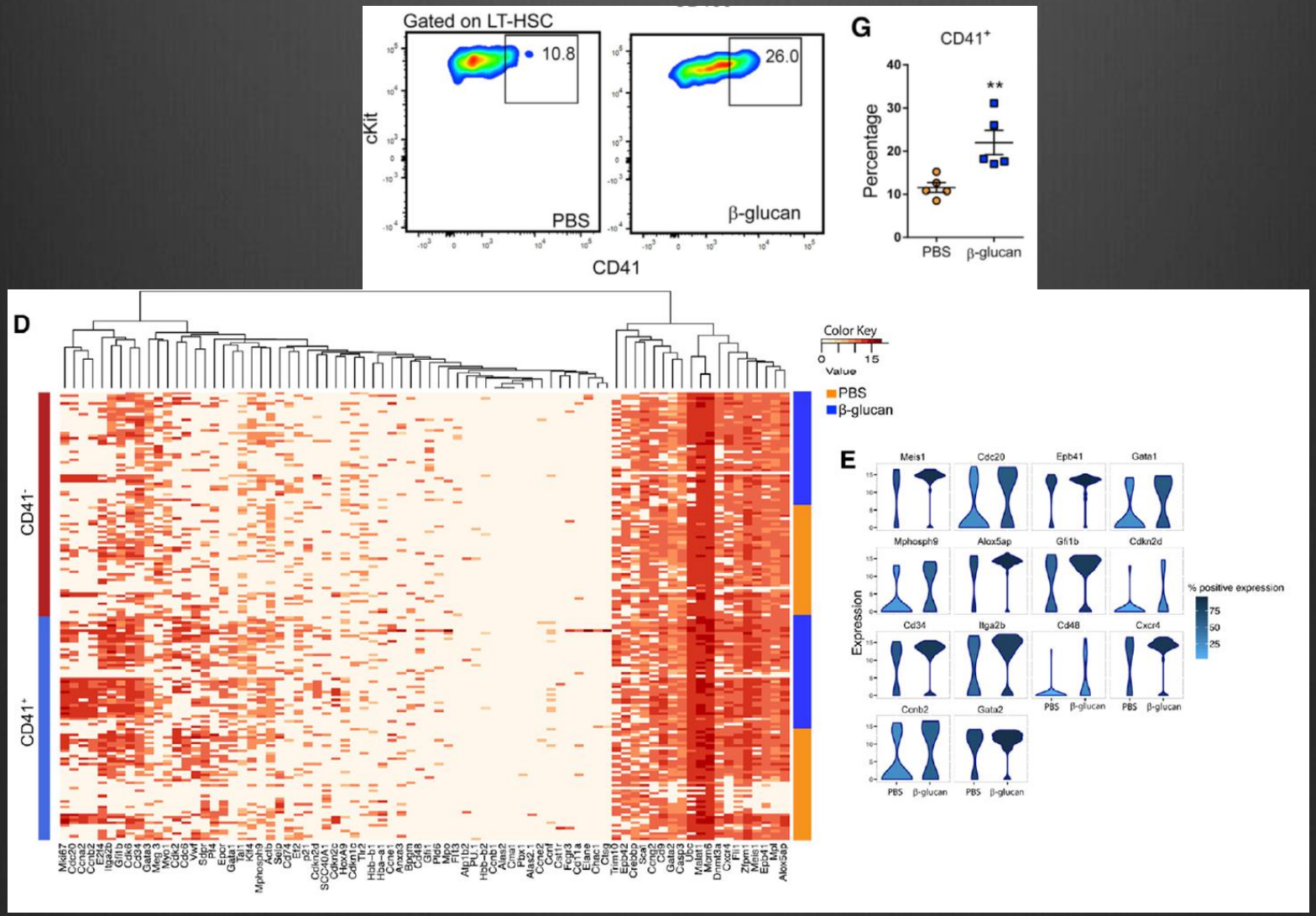
Takizawa et al, Blood 2012

Hematopoietic progenitor heterogenicity



Herault et al, Nature 2017

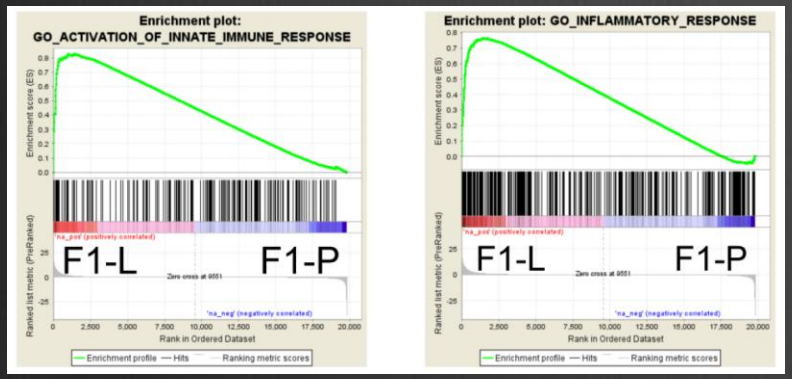
Inflammatory Reprogramming of Hematopoietic Progenitors

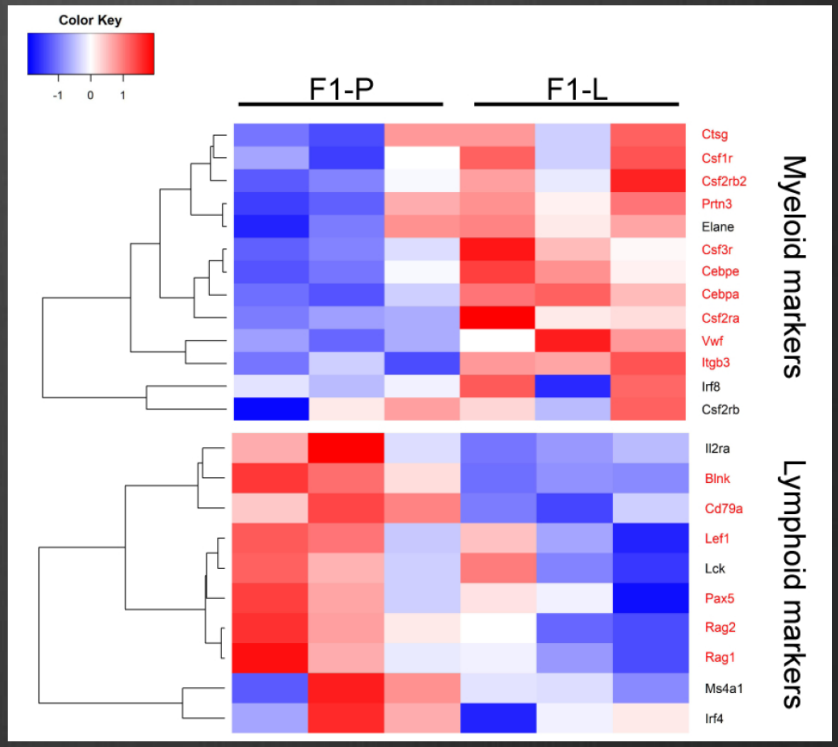


Mitroulis et al, Cell, 2018

Application in autoimmune diseases

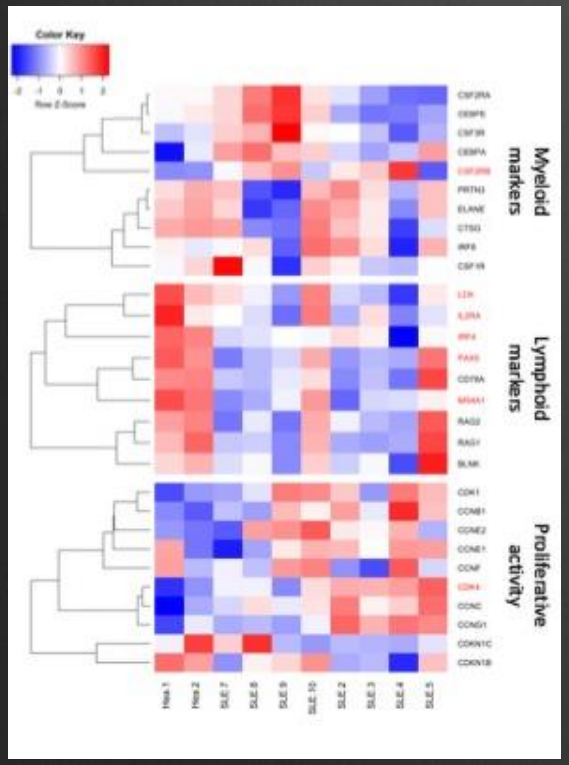
Myeloid reprogramming of HSPCs in a mouse model of SLE

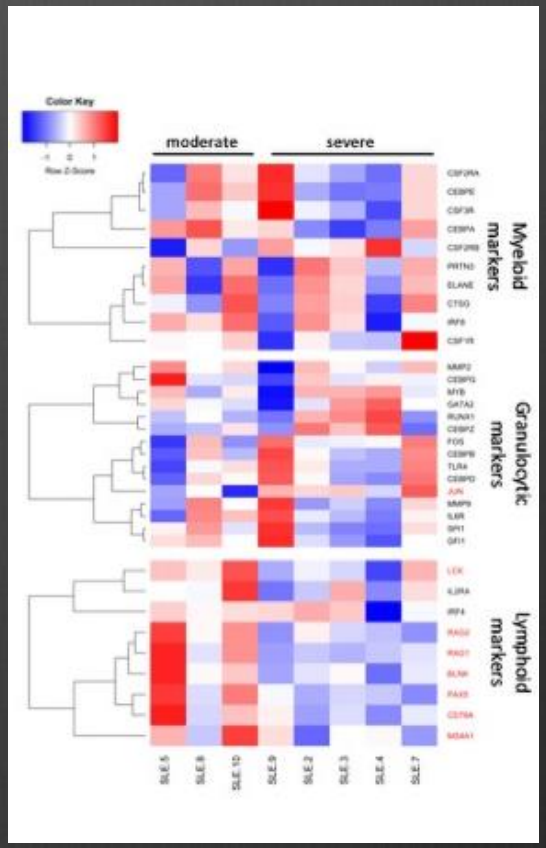




Grigoriou et al, ARD, 2020

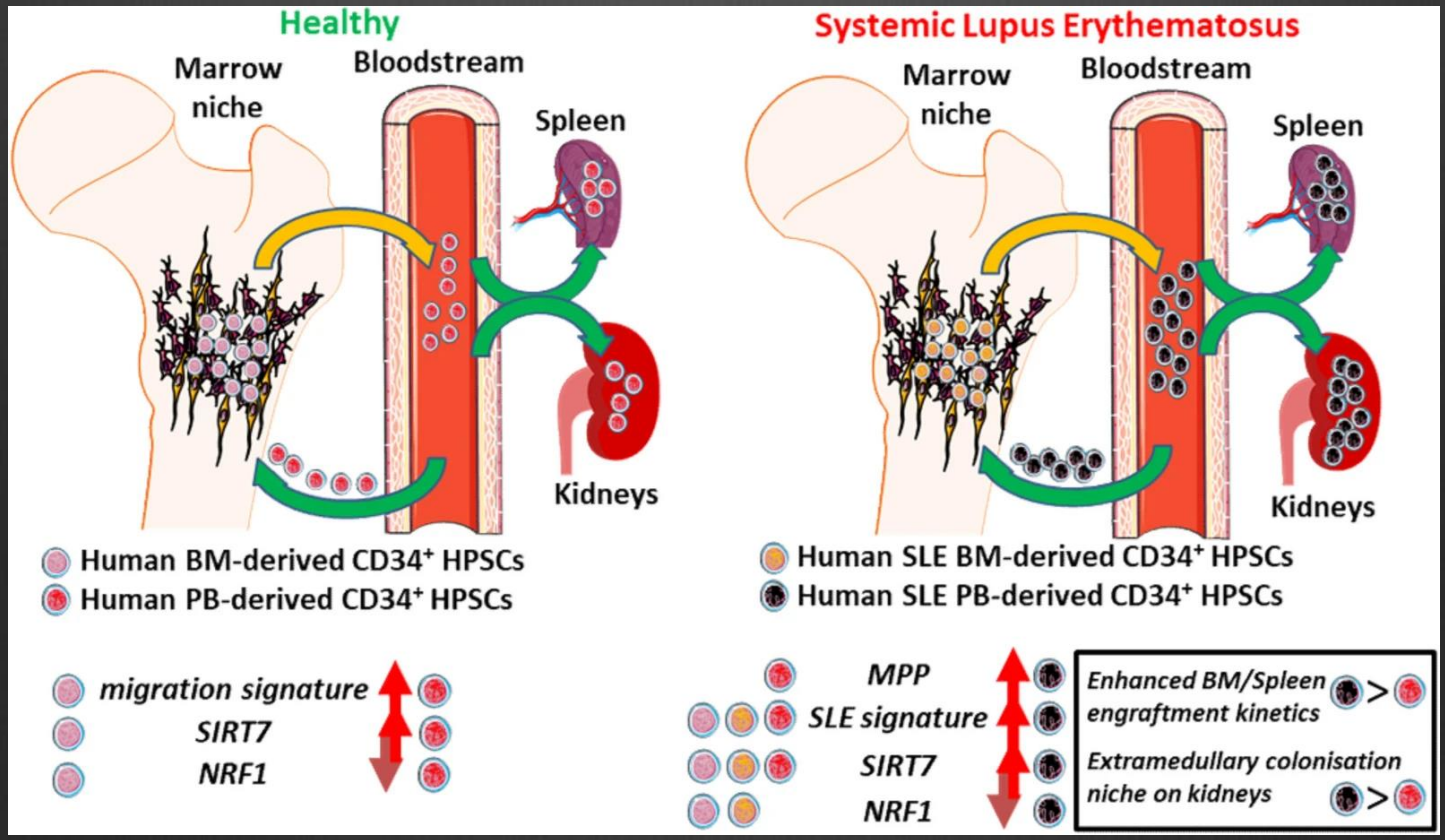
Myeloid reprogramming of HSPCs in SLE





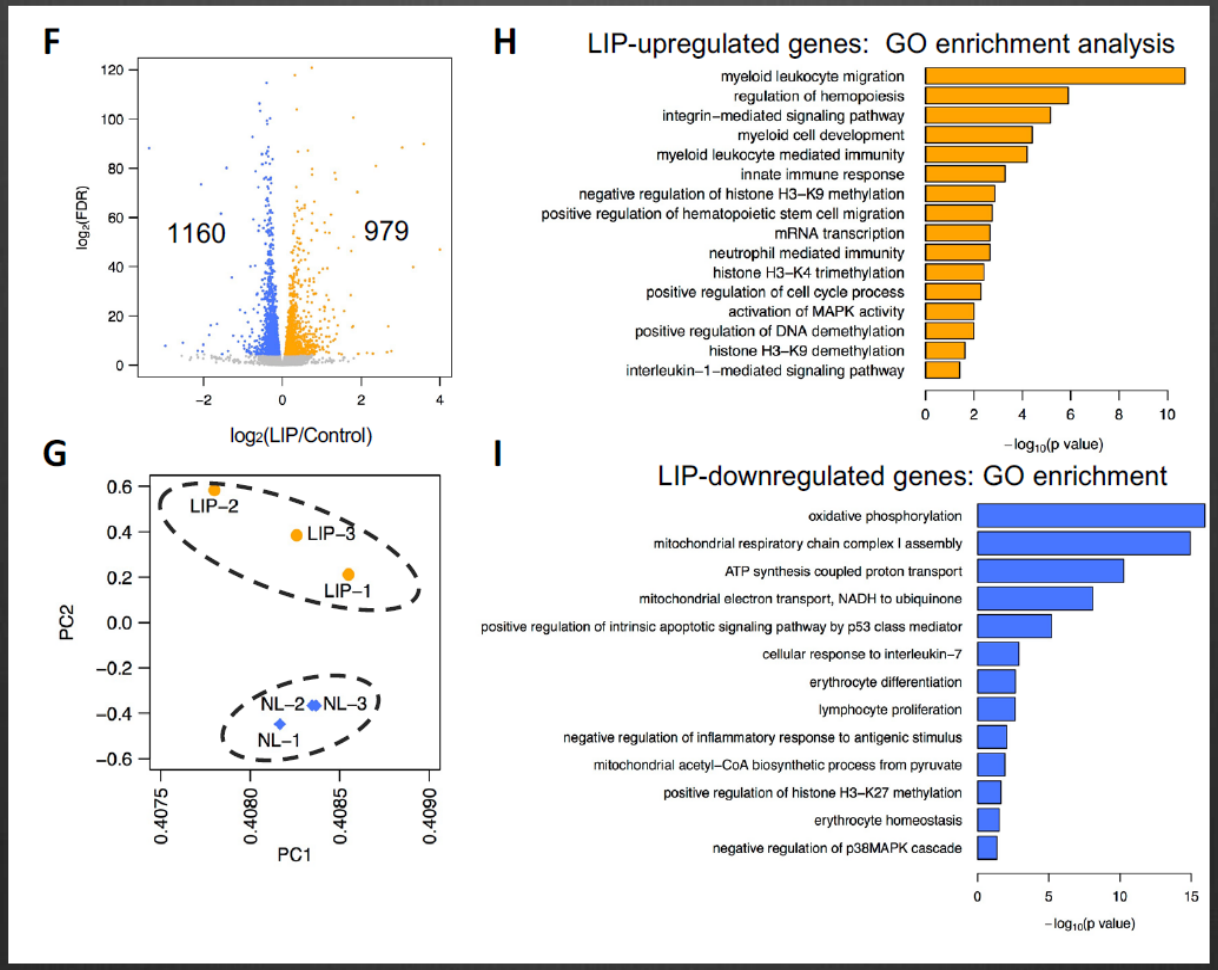
Grigoriou et al, ARD, 2020

Increased levels of circulating HSCPs in SLE



Kokkinopoulos et al, Scientific Rep, 2021

Reprogramming of hematopoietic progenitors may provide the link between inflammatory comorbidities (arthritis and periodontitis)



Li et al, under review

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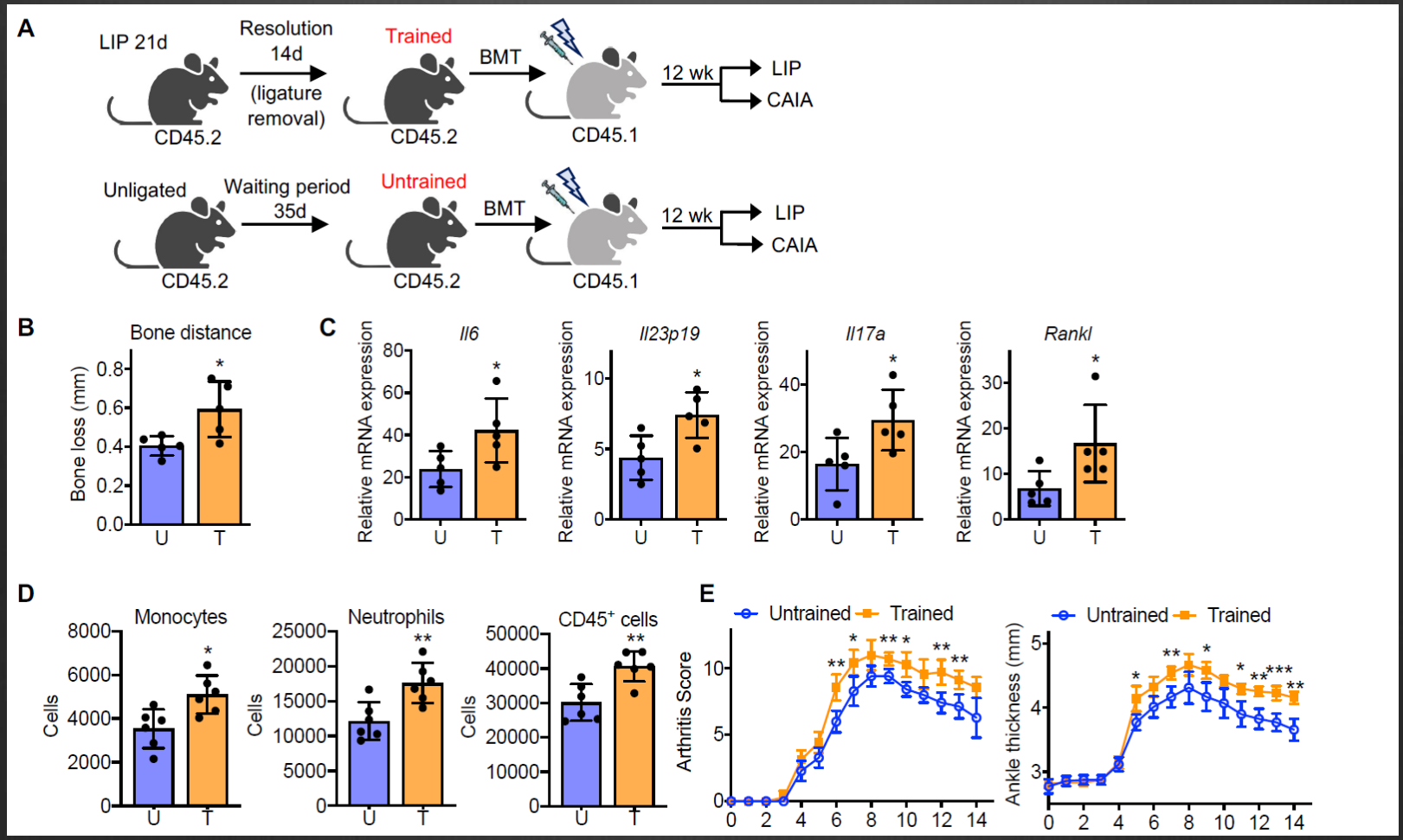

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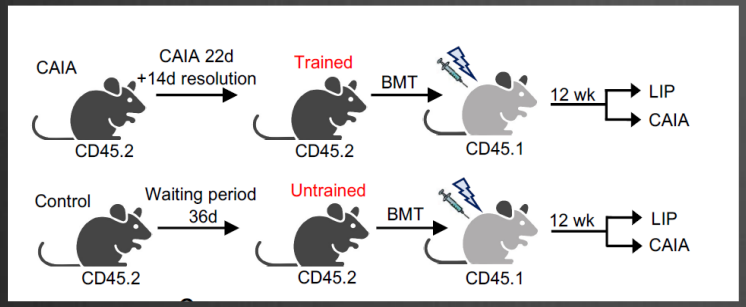
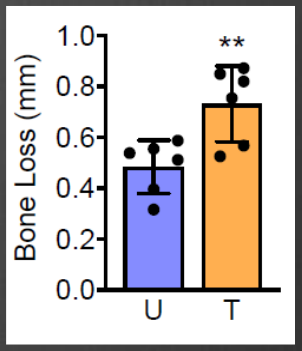
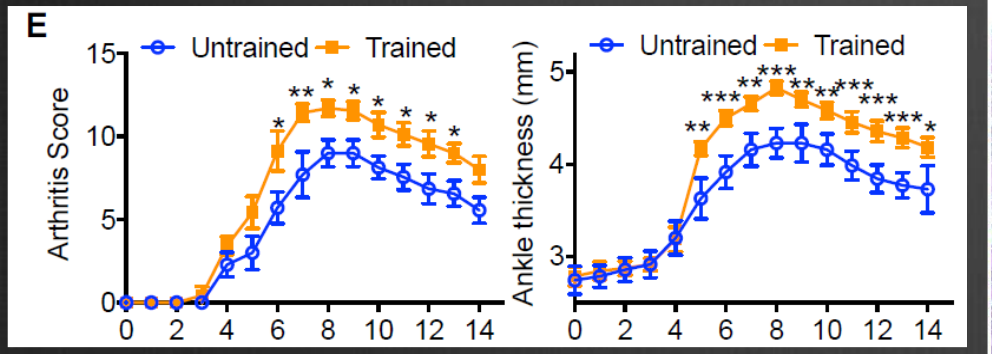
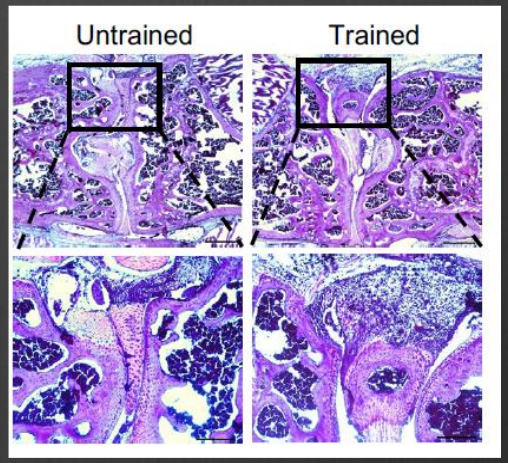


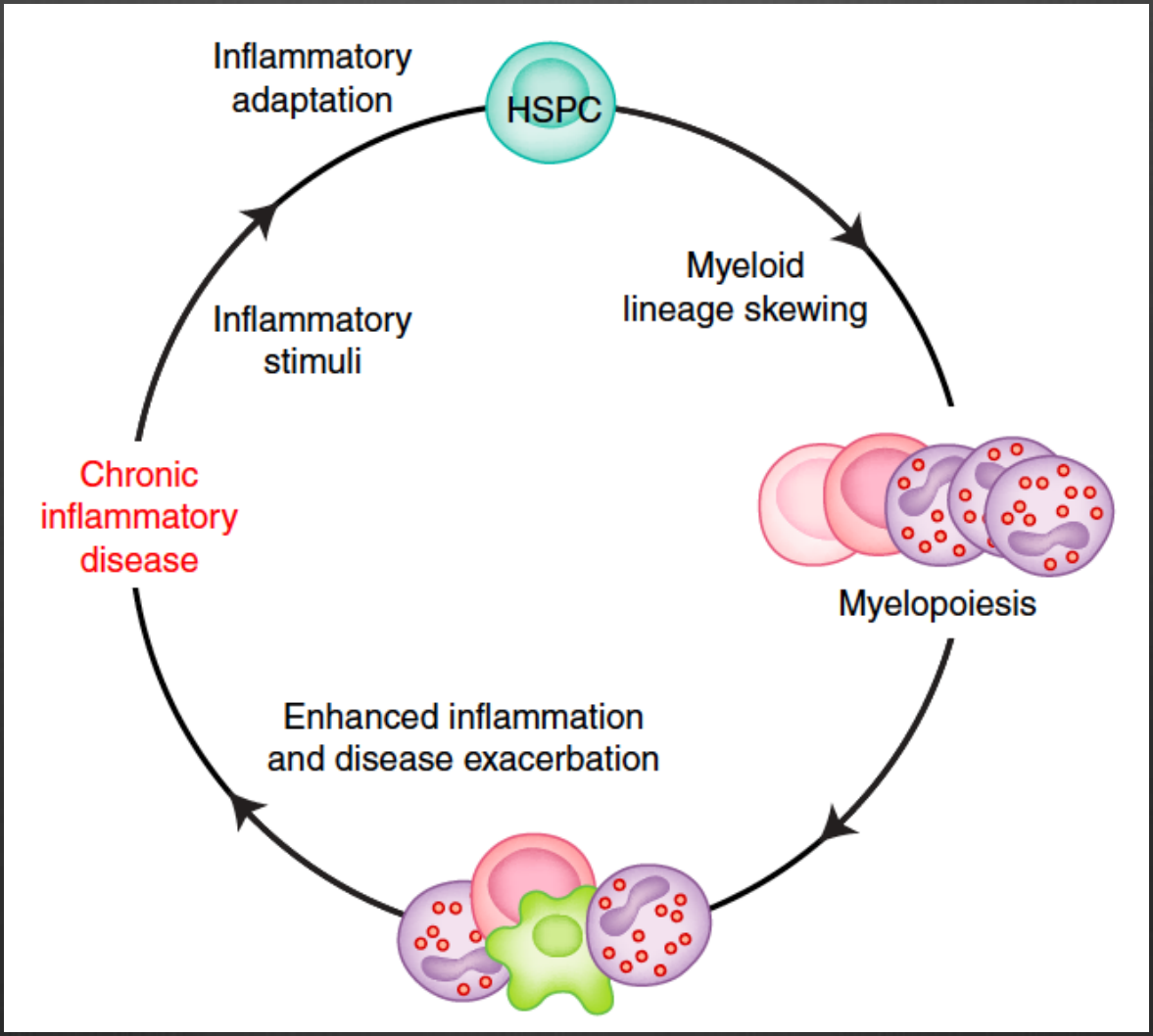






Li et al, under review

Feed-forward loop that links the adaptation of HSPCs to inflammation with chronic inflammatory disease



Chavakis, Mitroulis, Hajishengallis, Nat Immunol, 2019

Thank you for your attention