



Invitée par l'assemblée du Collège de France
sur proposition des Prs Denis Duboule & Hugues de Thé

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7 > 18 novembre 2025

Hematopoietic stem cell through the ages: a lifetime of adaptation to organismal demands

Amphithéâtre Mireille Delmas-Marty à 17 h 30

Hematopoiesis is a constant, vital function of the body by which all cells of the blood and immune system are produced throughout development, adulthood, and old age. Blood production by hematopoietic stem cells (HSC) supports oxygen transport, wound healing, and immunological responses during different stages of life, with dynamic regulations tailoring the production of particular lineages of blood cells through a complex array of intrinsic and extrinsic mechanisms. HSCs are equipped with a unique network of stress-response mechanisms that enable them to rapidly respond to organismal demand while simultaneously protecting themselves from insults. However, these pro-survival mechanisms provoke specific genetic, epigenetic, and metabolic forms of damage that accumulate over time, leading to an expanded pool of indolent and functionally degraded old HSCs. In this series of lectures, we will describe central features of HSC regulation during ontogeny to contextualize how adaptive responses over the life of the organism ultimately form the basis for HSC functional degradation with age. We will also discuss how the knowledge of age-related changes in HSC regulation can inform strategies for treating inflammatory disease conditions and rejuvenating old HSCs.

Vendredi 7 novembre 2025

Principle of hematopoietic stem cell biology
and blood production

Mercredi 12 novembre 2025

Environmental crosstalk and bone marrow niche regulation

Jeudi 13 novembre 2025

Adaptive and maladaptive myeloid cell production

Mardi 18 novembre 2025

Hematopoietic stem cell aging and adaptation to stress

Illustration : *Hematopoietic stem cells protective strategies.*
Dessins réalisés par Flo (artiste commissionné).