

★ Stem Cell Biologyセミナー ★

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Circadian rhythms metabolically regulate primitive hematopoietic stem cells by Wnt signaling

日時: 2023年4月6日(木)17:00~

会場: 研究所B1F会議室AB(皆様のご参加をお待ちしております)

Lapidot博士は造血分野における最先端の研究者の一人で、これまでがん幹細胞の最初の例としてヒト白血病幹細胞の存在を証明し、その後造血幹細胞を維持する微小環境(ニッチ)を構成する細胞と分子機構に関する幹細胞生物学のマイルストーンとなる成果を報告してきました。本講演ではサーカディアンリズムと造血幹細胞の代謝制御についての最新の知見をご紹介します。ご来聴をお待ちしています。

【Abstract】

Primitive hematopoietic stem cells (pHSCs) are mostly retained in the mouse bone marrow (BM) in a low metabolic, non-motile and quiescent state. Previously, others and we reported that circadian cues regulate hematopoietic stem and progenitor cells (HSPC) fate decisions. Daily light cues induce a fraction of BM HSPCs to proliferate, differentiate and egress from the BM to the blood, in order to replenish the circulation with mature blood and immune cells with a finite life span. While darkness cues metabolically reprogram HSPC in order to elevate their self-renewal to maintain the BM reservoir of immature and undifferentiated HSPC. We also reported higher BM retained competitive pHSC repopulation potential at night darkness compared to daylight morning. The dynamic switch between HSC quiescence and metabolic activation involves transient light onset mediated increase in their ROS levels and darkness onset mediated increase in BM melatonin and PGE-2. Currently we aim to study how the intrinsic cell signaling pathways dictate metabolic changes among pHSCs under circadian rhythms and to elucidate the mechanisms behind these changes.

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