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Human adipocyte progenitors: Proliferation and differentiation in the obesity context

Adipose tissue expansion is well-orchestrated to fulfill the energy demand. A pool of adipocyte progenitors (APs) is responsible for the formation of new adipocytes and for the potential of this tissue to expand in response to chronic energy overload. However, molecular mechanisms controlling proliferation and differentiation of human APs are largely unknown. Chronic low grade inflammation and hypoxia take place in obese and diabetic adipose tissue microenvironment. We will discuss the role playing by the TGFb family members in human adipogenesis. We will show that macrophages that are located in obese adipose tissues regulate AP self renewal through activin A. The immediate early response 3 gene (IER3) is required for AP proliferation and differentiation and IER3 expression is a common target of activin A and hypoxia. Altogether, we propose a model in which changes in the obese adipose tissue lead to expansion through activin A and IER3 that are potential targets for controlling the size of AP pool in adipose tissue.

Biography

Christain Dani, PhD, is an expert in human adipose-derived stem cells and differentiation of pluripotent stem cells into adipocytes. He did a PhD in Molecular Biology in Montpellier University, France. Then, he conducted a 2-year program research on the biology of embryonic stem cells in Pr. A. Smith's laboratory (Edindurgh, Scotland). He is now director of research at the French National Institute for Health and Medical Research (INSERM) and the Director of the "Stem Cells and Differentiation" laboratory at the University of Nice-Sophia Antipolis.

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