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RegenerAging from miRNA fingerprint of aged progenitors to *ex vivo* reprogramming strategies for improved MSC performance and therapeutic potential

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It is known that progenitor cells undergo an age-dependent decline in their number and function resulting in tissue aging and disease. Since their *ex vivo* isolation has been introduced in regenerative medicine, these impairments may limit stem cells performance *ex vivo* and possible after transplantation. Therefore, we considered that the identification of possible molecular fingerprints driving aging can contribute in better age-related disease understanding and in generating tools to favor *ex vivo* progenitor performance for improved therapeutic benefits. Starting from an age-related comparison of a know stem cell type, we identified aged progenitor-specific miRNA signature that involves only 7 microRNA. Focusing on their targets, we selected *HOXB7* as age related gene and whose expression was inversely correlated with senescence. Forced *HOXB7* expression was associated with an improved cell growth, a reduction of senescence and an enhanced osteogenesis, linked to a dramatic increase of autocrine bFGF secretion. Based on these original observations we proposed an *ex vivo* HOX-based reprogramming strategy aimed to empowering key features of mesenchymal adult progenitors for innovative approaches of tissue regeneration and repair.

Biography

Olivia Candini is a Post-doctoral Associate in the Laboratory of Cell Therapies of the Department of Medical and Surgical Sciences at the University of Modena, Italy. Since last 5 years she has been working with mesenchymal stem cells (MSC) to better understanding the impact of aging on progenitor properties. Based on her combined expertise in cell and molecular biology, she is therefore deeply engaged in innovative approaches to enhance MSC performance and skeletal regeneration.

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