Introduction

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There is growing evidence that adult stem cells age. This process can result in alterations in stem cell number and function, leading to distinct phenotypic outcomes in different organ systems.

The molecular causes of stem cell aging remain to be defined. There is evidence that stem cell aging can involve cell intrinsic as well as ex-

trinsic alterations that affect the stem cell niche or the macro-environment. In various organ systems, stem cells represent the most long-living population of cells retaining a capacity to proliferate and differentiate. The aging of adult stem cells likely plays a key role in the decline of organ maintenance and regenerative reserve during ag-

ing and at the end stage of chronic diseases. In addition, it may contribute to stem cell transformation and carcinogenesis.

Given the pivotal role of adult stem cells in aging, regeneration and cancer, the Else Kröner-Fresenius Stiftung decided to initiate a symposium focusing on adult stem cell aging. The symposium, in May 2009, brought together leading experts in the field in an atmosphere that fostered scientific exchange and open discussion on new models and future concepts. The meeting

significantly contributed to scientific advancement in this emerging field of research, which should ultimately lead to the development of new therapies in aging, regeneration and cancer. This book represents a meeting report summarizing the current knowledge in the field of stem cell aging and reviewing the emerging topics discussed at the Else Kröner-Fresenius Symposium on the Molecular Mechanisms of Adult Stem Cell Aging.

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