Foreword

Aging is a complex time-related process resulting in a progressive impairment of physiological function and encompassing both a genetic and environmental component.

Therefore, computational strategies and bioinformatic tools are needed to enhance research toward a better understanding of the basic processes of intervention in aging-associated diseases.

Having acknowledged that aging research holds high promise for future biomedical research, I am delighted to write the Foreword to the book *Medical Advancements in Aging and Regenerative Technologies: Clinical Tools and Applications*, as its scope and content provide both students and researchers from various disciplines with a broad introduction to aging research as well as regenerative methodologies and showing their usefulness in a multitude of applications. The book targets aging research from an experimental as well methodological direction.

The experimental path contributes articles that highlight applications in important problem domains, for example cancer treatment among others, as well as in specific processes, such as age-associated regulation of gene expression, and with respect to specific experimental techniques.

The editor, Dr. Andriani Daskalaki, who works in the field of systems biology and bioinformatics at the Max Planck Institute for Molecular Genetics, has gathered contributions from experts across the globe. Contributions are from Greece, Bulgaria, Sweden, United Kingdom, The Netherlands, Canada, Australia, Japan, and of course Germany. The authors write about aging research including basic research related to immunogenicity of stem cells, regulation of gene expression underlying osteo-, adipo-, and chondro-genic lineage commitment of human mesenchymal stem cells, analysis of BMP signalling, which is pivotal in tissue regeneration, clinical application methods in vascular therapy, as well as dental tissue engineering research and translational approaches towards clinical applications.

This book, *Medical Advancements in Aging and Regenerative Technologies: Clinical Tools and Applications*, highlights practical medical applications and basic research into aging and, therefore, should be of great interest in the area of molecular medicine.

James Adjaye, 2012
Max-Planck Institute for Molecular Genetics, Germany

James Adjaye, *Prof., has worked since 2001 as a Group Leader of the Molecular Embryology and Aging Group in the Max Planck Institute for Molecular Genetics in Berlin (Department, Prof. Hans Lehrach). His work and research is divided into the following inter-related areas: transcriptional mechanisms regulating self-renewal and pluripotency in human embryonic stem cells, carcinoma cells, and iPS cells. His lab also derives disease specific iPS cells (eg Steatosis, NBS, and Alzheimer's disease) to model and decipher underlying disease mechanisms. He is now the Director of a new stem cell research institute, which will make up a new part of the pre-existing Institute for Transplantation Diagnostics and Cell Therapies (ITZ) at the Heinrich-Heine University in Düsseldorf, Germany. His ultimate goal is the banking of clinical grade iPS cells (induced pluripotent stem cells) derived from cordblood cells with defined HLA haplotypes to be used in cell replacement therapies and toxicology studies.*