From Auto- to Allotransplantation
Translational Research in Biomedicine

Vol. 5

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The Chang Gung Medical Foundation is the patron of this book series.
From Auto- to Allotransplantation

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46 figures, 43 in color, and 3 tables, 2016
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Foreword

Welcome to volume 5 of Translational Research in Biomedicine, a monograph series dedicated to the dissemination of seminal information in contemporary biomedicine with a translational orientation. This volume marks the third installment of this series under the generous patronage of Chang Gung Medical Foundation, Taiwan. This patronage reduces substantially the increasing financial constraints on scientific publication, and allows us to concentrate on publishing timely and crucial themes in translational medicine.

This volume is designed to be a key reference on the evolution of reconstructive microsurgery, from free autologous tissue transfer to vascularized composite allotransplantation. Despite the high success rate of microsurgical autotransplantation in the hands of these surgeons, there are still body defects that are too complex to be remedied by reconstruction with autologous tissue. Although still in its infancy, clinical vascularized composite allotransplantation offers a revolutionary approach that not only pushes the forefronts of reconstructive surgery to another level, but offers a viable alternative to improve the quality of life of afflicted patients. Authored by pioneers in reconstructive surgery, the narratives are essentially recapitulations of personal experiences of practitioners who set new trends in this field. In the spirit of translational medicine, this clinical know-how is accompanied by parallel research development in immunology and cell biology aiming at achieving donor-specific tolerance.

I wish to express my deepest appreciation to Drs. Fu-Chan Wei, Hui-Yun Cheng, and Cheng-Hung Lin, who despite their heavy clinical commitments have made this timely volume on the developments ‘from auto- to allotransplantation’ a reality. I also wish to acknowledge the capable hands of Thomas Nold, Freddy Brian, and Magdalena Mühlemann at S. Karger AG during the development and production of this volume. Last but not least, the publication of Translational Research in Biomedicine would not have been possible without the foresight, enthusiasm, and whole-hearted support of my dear friend, Dr. Thomas Karger.

Samuel H.H. Chan, Kaohsiung
Series Editor
Autologous free tissue transfer has been the epitome of reconstruction for cancer, trauma, and congenital deformities over the past four decades. However, in spite of accumulation of experience and achieving high success rates in microsurgical reconstruction, there are still a few complex and/or extensive defects that need to be addressed. As a result, allotransplantation has grown, inevitably aiming for more and pushing a new paradigm in reconstructive surgery for enhancing the quality of life for those deemed unreconstructable and who need a revolutionary solution. So far, new life has been given to nearly 200 patients who have received a wide array of hand, abdominal wall, and face allotransplantations.

This book follows the evolution of reconstructive microsurgery from free autologous tissue transfer to vascularized composite allotransplantation in three sections. Section I concentrates on the state of the art in microsurgery, capitalizing on more than 20,000 cases of microsurgical free flap reconstruction experience from head to toe and their limitations at Chang Gung Memorial Hospital, preparing the readers for the next leap addressed in Section II. Section II focuses on allotransplantation, with the opening chapter drawing lessons learned from solid organ allotransplantation, which is essential for the development and application of vascularized composite allotransplantation in the hand and upper extremities and face. Section III targets the translational and basic research needed for sustainable allotransplantation, which aims to make allotransplantation more immune-friendly, featuring new animal models for immunological studies, including cell therapies and other cutting-edge techniques for achieving donor-specific tolerance as well as assessment of functional recovery with the latest in noninvasive imaging, and possible new frontiers in microRNAs and induced pluripotent stem cells.

We are grateful to Karger Publishers (Basel, Switzerland) and to the Series Editor Dr. Samuel H.H. Chan for the opportunity to publish this volume. This book commemorates the 4-year anniversary of the official establishment of the Center for Vascularized Composite Allotransplantation at Chang Gung Memorial Hospital, and we are proud to say that it is the most complete, up-to-date record on where we stand at this moment in auto- and allotransplantation. It represents a massive work by those
who set the new trends in reconstructive surgery, and is a worthwhile read for all of those who are interested in both microsurgical free flaps and conquering new frontiers in reconstructive surgery.

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