

BOOK REVIEW

Organ Repair and Regeneration. Eds: Giuseppe Orlando and Shaf Keshavjee. London, UK: Academic Press, 2021; 289 pages

This is the latest in a series of textbooks published by Academic Press/Elsevier, edited or co-edited by Dr. Giuseppe Orlando, in the broad field of organ transplantation and covering all aspects of organ regeneration, from technological advances in organ preservation and reperfusion to regenerative medicine [1–3]. Orlando is a kidney and pancreas transplant surgeon from Wake Forest University, a unique environment in which a strong transplant programme coexists with a world-renowned institute of regenerative medicine, led by Dr. Anthony Atala.

Organ Repair and Regeneration is a 289-page book co-edited by Orlando and Dr. Shaf Keshavjee, who has been a pioneer in the reconditioning of marginal lung grafts. The book is divided into 14 chapters written by authors from North America, Europe and Australia. In his foreword to this book, Dr. Atala sets the stage for what readers can expect from this book: ‘...we have developed a surrogate field of science called ‘organ preservation’ that – to the editors of this book – represents the most formidable platform nowadays for the application of regenerative medicine technologies in transplant medicine’ [4].

The book is divided into 14 chapters that can each be read as an independent review article. It is introduced by a chapter describing the concepts and molecular mechanisms of ischaemia-reperfusion injury that will be a reference for all further chapters of the book. Chapter 1 includes a comprehensive list of all published interventional clinical trials aiming to counteract delayed graft function, the vast majority of which had no clear effect and preclinical studies on animal models of ischaemia-reperfusion injury.

Chapters 2–11 are devoted, in a sequence that it not always easy to follow, to various strategies of organ repair and reconditioning, most chapters being centred on one organ, and most organs (kidney, liver, pancreas, heart) being covered by machine perfusion strategies. Curiously, given the expertise in lung transplantation of one of the co-editors, lung reconditioning is almost not covered, except in a short chapter on the vision for an organ repair centre (chapter 12). Beyond machine perfusion strategies that make up the bulk of the textbook,

cell therapy – with mesenchymal stromal cells (MSCs) – or RNA interference are presented as strategies that could supplement or even replace machine perfusion for a number of different organs.

Chapter 13 is the most intriguing of the book, addressing the potential for mitochondria transplantation for the repair of damaged organs. Mitochondria are the energetic powerhouse of the cell, and the authors from the University of Torino explain that injured cells can acquire mitochondria from other donor cells, rather than simply repair them. They review experimental evidence that mitochondria can be artificially transferred to contribute to cardiomyocyte repair in a variety of situations, and rather convincingly argue that mitochondrial transplantation could become a powerful organ repair strategy.

The final chapter wraps up the whole book. It discusses ‘how the transplant landscape is changing in the regenerative medicine era’. The field of replacement of failing organs is evolving from times where organ transplantation was a technically challenging and the only available lifesaving option. With the rapid development of organ reconditioning and regenerative medicine, the whole field is contemplating a revolution, in which marginal organs will be salvaged by novel preservation technologies, essentially represented by in situ or ex vivo reperfusion as a first step. The whole field of regenerative medicine and artificial organs will closely follow to offer solutions that do not depend on the scarce resource of organ donors. *Transplant International* and ESOT recognize the increasing importance that organ reconditioning and regenerative medicine will take in the replacement of failing organs. The visibility given to these fields in ESOT congresses should be obvious by now, and *Transplant International* is committed to increase the number of articles on related topics in the near future. In this regard, the publishing of this book is a timely opportunity for the new editorial board to introduce the fields it is committed to develop in its contents [5].

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REFERENCES

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