Hand Transplantation
“to my wife Mariagrazia and my sons Matteo, Michael and Pietro, for sharing all my dreams, and to Valter, Gianni, Domenico, heroic patients, for their trust in me and my trust in them”

Marco Lanzetta

“to my grand children Louis, Hugues, Alexis, Émilie, Céline, Elsa ... dreams might come true”

Jean-Michel Dubernard
The story of this book is quite simple: after the first few hand transplants, we felt the need to have regular meetings so that our clinical experiences would be beneficially shared and serve as a basis to draw some guidelines for the future. In so doing, we soon realised that a huge amount of original clinical data and information was becoming available as we were proceeding with our operations and closely following our patients’ progress and functional outcomes. Some of these data were reported in scientific articles, but to group them in a comprehensive book seemed the best way to provide a complete review of this pioneering work.

Since starting our hand transplantation programmes, we often felt we were exploring a new area of surgery without the possibility or comfort of referring to already published work to support our own decisions. Indeed, some aspects of hand transplantation required prompt decisions based solely on personal interpretation of presenting clinical scenarios. New techniques were introduced to address different needs, such as the analysis of brain remodeling using functional magnetic resonance imaging or the use of a sensory glove to precondition the patient or accelerate the recovery of sensibility. Original work included creation of a specific consent form for patients, psychological tests for candidates and a comprehensive scoring system for assessing clinical outcome. There was the need to establish a grading system to evaluate acute skin rejection and clear criteria to select ideal candidates. From a legal point of view, there were no criteria as to how the disability of these patients would be revaluated after the hand transplant.

Clinically, the most challenging issues have been identifying the best immunosuppressive drug regime and understanding how acute rejection develops and how to reverse it. Use of an additional distant skin island allograft resulted in better rejection monitoring, at the same time avoiding the need to take multiple biopsies from the hand. Nerve regrowth and excellent sensibility/motor recovery was one of the most important results in hand transplantation, and leading experts in peripheral nerve regeneration suggest a scientific explanation. Rehabilitation of the transplanted hand has been very demanding for both therapists and patients, and specific protocols had to be implemented.

As the hand is only one of the composite tissues currently transplanted in order to correct disabilities or deformities, we include chapters on all the other types of non-life-saving allografts, including the face, knee joint, uterus, abdominal wall and larynx.

We are honoured to have such a great number of internationally renowned personalities share their experience and knowledge in this book; their contributions have made it the most complete work available on hand and other composite tissue allografts. We hope it will serve as a useful guide for those desiring to launch their own composite tissue transplantation programmes or to those who simply wish to read about the current state of the art of this new and exciting field.

Marco Lanzetta
Jean-Michel Dubernard
1. HISTORICAL REMARKS

1a. Cosmas and Damian revisited
B.W. CONOLLY, M. BENANZIO ................................................................. 3

1b. Hand Transplantation as an Evolution of Microsurgery: A Logical Step Towards Better Reconstructive Options
M. LANZETTA ................................................................. 11

2. EXPERIMENTAL LIMB TRANSPLANTATION

2a. Hind-Limb Transplantation in the Rat: Surgical Technique, Anaesthesia and Early Postoperative Management
M. MOLITOR, T. KANATANI, M. LANZETTA ................................................................. 27

2b. Indefinite Survival and Functional Recovery of Limb Allografts in Rodents
T. KANATANI, M. LANZETTA, G.A. BISHOP ................................................................. 41

2c. Induction of High-Level Chimerism in Composite Tissue Transplants
K. MURAMATSU, K. DOI, H. TANAKA, T. TAGUCHI ................................................................. 47

2d. Simultaneous Vascularised Bone Marrow Transplantation to Promote Acceptance of Limb Allografts
M. LANZETTA, A. KUBITSKIY, G.A. BISHOR, J. LI, G.W. McCaughan ................................................................. 57

2e. Experimental Approaches to Composite Tissue Allograft Transplants
M. SIEMIONOW, Y. KULAHCI ................................................................. 61

D. ZAMFIRESCU, I. LASCAR ................................................................. 79

2g. The History of Experimental Hand Transplantation in Primates
R.K. DANIEL, K.A. BRENNER ................................................................. 89

2h. Hand Transplantation in Monkeys: Technical Details and Immunological Aspects
S.E.R. HOVIUS, H.M. ZUIJDENDORP, J.J.P.D. STEVENS ................................................................. 95
### Contents

5e. Technical and Surgical Details of Hand Transplantation  
M. Ninkovic .......................................................... 197

5f. Hand Replantation and Transplantation: More Differences than Similarities  
M. Lanzetta, R. Nolli .................................................. 205

6. IMMUNOLOGY OF HAND TRANSPLANTATION

Current Concepts  
O. Thaunat, E. Morelon ............................................. 209

7. IMMUNOSUPPRESSIVE THERAPY

7a. Induction and Maintenance Therapy  
P. Petruzzo .......................................................... 217

7b. Side-Effects and Potential Complications  

7c. CMV Infection and Reactivation  
S. Schneeberger, R. Margreiter, S. Lucchina, M. Lanzetta, H. Bonatti ............................................. 227

7d. Specific T-Cell Response to HCMV Infection  
G. Lucchini, P. Pioltelli, M. Lanzetta ............................................. 237

7e. Ocular Complications after Hand Transplantation  
D. Veritti, P. Lanzetta ............................................. 241

8. LIMB REJECTION AND MONITORING

8a. Skin Rejection in Human Hand Allografts: Histological Findings and Grading System  
J. Kanitakis .......................................................... 249

8b. Pharmacological Treatment of Rejection  
P. Petruzzo .......................................................... 259

8c. Monitoring Rejection with a Distant Sentinel Skin Graft  
M. Lanzetta, L. Rovati ............................................. 263

9. FUNCTIONAL RECOVERY OF TRANSPLANTED HANDS

9a. Bone Healing in Hand Transplantation  
M. Gabl, S. Pechlaner, M. Lutz, R. Arora, M. Blauth, M. Rieger, M. Ninkovic, H. Piza, S. Schneeberger, R. Margreiter ............................................. 271

9b. Return of Sensibility and Motor Recovery of Extrinsic and Intrinsic Muscles  
G. Urso, L. Stroppa, T. Barchitta, P. Cossa ............................................. 279
## Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Pages</th>
</tr>
</thead>
<tbody>
<tr>
<td>9c. From Silent Neuroma to Reactivation of Axonal Growth: How a Peripheral Nerve can Start to Regenerate into a Transplanted Hand</td>
<td>291</td>
</tr>
<tr>
<td>L.B. DAHLIN, G. LUNDBORG</td>
<td></td>
</tr>
<tr>
<td>9d. Modified Visual Feedback in Rehabilitation</td>
<td>303</td>
</tr>
<tr>
<td>H. PARMENTIER</td>
<td></td>
</tr>
<tr>
<td>9e. Analysis of Motor Unit Reinnervation in Muscles of the Transplanted Hand</td>
<td>307</td>
</tr>
<tr>
<td>M. POZZO, D. FARINA</td>
<td></td>
</tr>
<tr>
<td>9f. Role of the Sympathetic Nervous System on Arterial Distensibility</td>
<td>317</td>
</tr>
<tr>
<td>C. GIANNATTASIO</td>
<td></td>
</tr>
<tr>
<td>9g. An Instrumental Kit for a Comprehensive Assessment of Functional Recovery</td>
<td>327</td>
</tr>
<tr>
<td>V. MACELLARI, S. MORELLI, C. GIACOMOZZI, G. DE ANGELIS, G. MACCIONI, M. PAOLIZZI, D. GIANSANTI</td>
<td></td>
</tr>
<tr>
<td>9h. Human Brain Plasticity after Bilateral Hand Allograft</td>
<td>341</td>
</tr>
<tr>
<td>A. ABALLÉA, P. GIRAUX, M. SCHIEBER, J.M. DUBERNARD, A. SIRIGU</td>
<td></td>
</tr>
<tr>
<td>9i. The Sensor Glove in Preoperative Conditioning and Postoperative Rehabilitation</td>
<td>347</td>
</tr>
<tr>
<td>G. LUNDBORG, B. ROSEN</td>
<td></td>
</tr>
<tr>
<td>9j. A Comprehensive Functional Score System in Hand Transplantation</td>
<td>355</td>
</tr>
<tr>
<td>M. LANZETTA, P. PETRUZZO</td>
<td></td>
</tr>
<tr>
<td>9k. Quality of Life in Hand Transplant Patients</td>
<td>363</td>
</tr>
<tr>
<td>D. BACHMANN</td>
<td></td>
</tr>
<tr>
<td>10. PSYCHOLOGICAL ISSUES IN HAND TRANSPLANTATION</td>
<td></td>
</tr>
<tr>
<td>10a. Psychological Evaluation and Patient’s Profile</td>
<td>369</td>
</tr>
<tr>
<td>I. CARTA, O. CONVERTINO, J. BAGNASCO, S. FORNARA</td>
<td></td>
</tr>
<tr>
<td>10b. Hand Transplant and Body Image</td>
<td>375</td>
</tr>
<tr>
<td>G. BURLOUX</td>
<td></td>
</tr>
<tr>
<td>10c. Psychological Effects of Hand Transplantation</td>
<td>381</td>
</tr>
<tr>
<td>I. CARTA, O. CONVERTINO, J. BAGNASCO, S. FORNARA</td>
<td></td>
</tr>
<tr>
<td>11. OTHER COMPOSITE TISSUE TRANSPLANT</td>
<td></td>
</tr>
<tr>
<td>11a. Allogeneic Vascularised Knee Transplantation</td>
<td>391</td>
</tr>
<tr>
<td>G. HOFMANN</td>
<td></td>
</tr>
<tr>
<td>11b. Laryngeal Transplantation</td>
<td>399</td>
</tr>
<tr>
<td>R.R. LORENZ, M. STROME</td>
<td></td>
</tr>
<tr>
<td>11c. Uterus Transplantation</td>
<td>409</td>
</tr>
<tr>
<td>W. FAGEEH, G. LUCCHINI</td>
<td></td>
</tr>
</tbody>
</table>
12. FUTURE DIRECTIONS

12a. Limb Transplantation in Congenital Deformities
A. Gazarian, D.O. Abrahamyan ................................................................. 445

12b. Mechanisms Involved in the Induction of Tolerance in Allogeneic Hand Transplantation: A Proposal
A. Eljaafari, P. Petruzzo, X. Martin, J.M. Dubernard .................................. 453

12c. Induction of Tolerance in Allotransplantation
M. Noris, G. Remuzzi ................................................................. 461

13. THE INTERNATIONAL REGISTRY ON HAND AND COMPOSITE TISSUE TRANSPLANTATION (IRHCTT)

The International Registry on Hand and Composite Tissue Transplantation (IRHCTT)
M. Lanzetta, P. Petruzzo, R. Margreiter, J.M. Dubernard, F. Schuind, W.C. Breidenbach, G. Lucchini,
S. Schneeberger, C. Van Holder, D. Granger, G. Pei, J. Zhao, X. Zhang ................................. 477

14. AN EXTENSIVE BIBLIOGRAPHY ON HAND TRANSPLANTATION

An Extensive Bibliography on Hand Transplantation
G. Lucchini ................................................................. 485

SUBJECT INDEX ................................................................. 491

15. VIDEO-CLIPS OF HAND TRANSPLANTATION (DVD)

Video-Clips of Hand Transplantation (DVD)
M. Lanzetta, J.M. Dubernard, F. Schuind
Contributors

Aballéa Antoine  
Cognitive Science Institute  
CNRS UMR  
Bron, France

Abrahamyan Davit O.  
Clinique du Parc  
Lyon, France

Abramowicz Daniel  
Department of Nephrology  
Erasme University Hospital  
Medical School of the Université libre de Bruxelles  
Bruxelles, Belgium

Arora Rohit  
Department of Traumatology  
The Medical University  
Innsbruck, Austria

Bachmann Danièle  
Department of Psychiatry  
Édouard Herriot Hospital  
Lyon, France

Bagnasco Juliette  
Department of Psychiatry  
San Gerardo Hospital  
University of Milan-Bicocca  
Monza, Milan, Italy

Barchitta Tatiana  
KIROS  
Hand Therapy Center  
Rome, Italy

Bellani Giacomo  
Department of Anaesthesia and Critical Care  
San Gerardo Hospital  
Monza, Milan, Italy

Benanzio Mario (deceased)  
Orthopaedic Surgeon and  
Medico-Legal Consultant  
Sydney, Australia

Bettella Lorenzo  
Former Clinical Fellow  
Hand Surgery and Microsurgery Unit  
San Gerardo Hospital  
Monza, Milan, Italy

Bishop G. Alex  
Collaborative Transplant Laboratory  
Sydney University  
Sydney, Australia

Blauth Michael  
Department of Traumatology  
The Medical University  
Innsbruck, Austria

Bonatti Hugo  
Department of General and Transplant Surgery  
Innsbruck Medical University  
Innsbruck, Austria

Brandacher Gerald  
Department of General and Transplant Surgery  
The Medical University  
Innsbruck, Austria

Breidenbach Warren C.  
Kleinert Kutz Hand Care Center  
Louisville, KY, USA

Brenner Kevin A.  
Unit of Plastic Surgery  
University of California  
Irvine, KY, USA
Burloux Gabriel  
Former Consultant  
Department of Psychiatry  
Édouard Herriot Hospital  
Lyon, France  

Cappellini Anna  
Histopathology Unit  
San Gerardo Hospital  
Monza, Milan, Italy  

Carta Italo  
Department of Psychiatry  
San Gerardo Hospital  
University of Milan-Bicocca  
Monza, Milan, Italy  

Coletti Rosella  
Italian Institute of Hand Surgery  
Monza, Milan, Italy  

Conolly Bruce W.  
Hand Surgery Unit  
Sydney and St. Luke’s Hospitals  
University of Sydney  
Sydney, Australia  

Convertino Ornella  
Department of Psychiatry  
San Gerardo Hospital  
University of Milan-Bicocca  
Monza, Milan, Italy  

Cossa Paola  
Hand Therapy Unit  
San Gerardo Hospital  
Monza, Milan, Italy  

Cozzoli Mauro  
Pontifical Lateran University  
Rome, Italy  

Dahlin Lars B.  
Department of Hand Surgery  
Malmö University Hospital  
Malmö, Sweden  

Daniel Rollin K.  
Plastic Surgery Unit  
University of California  
Irvine, USA  

De Angelis Giorgio  
Department of Technology and Health  
Istituto Superiore di Sanità  
Rome, Italy  

De Marchi Lorenzo  
Former Clinical Fellow  
Department of Anaesthesia and Critical Care  
San Gerardo Hospital  
Monza, Milan, Italy  

Devauchelle Bernard  
Maxillofacial Unit  
Nord Hospital  
CHU Amiens, France  

Dezza Clara  
Former Clinical Fellow  
Hand Surgery and Microsurgery Unit  
San Gerardo Hospital  
Monza, Milan, Italy  

Doi Kazuteru  
Department of Orthopaedic Surgery  
Ogori Daiichi General Hospital  
Yamaguchi, Japan  

Dubernard Jean-Michel  
Department of Transplantation  
Édouard Herriot Hospital  
Lyon, France  

Eljaafari Assia  
Mixed Unit of Immunogenomics,  
BioMerieux/HCL and Unit of  
Transplantation Surgery  
Department of Dermatology  
Édouard Herriot Hospital  
Lyon, France  

Fageeh Wafa  
King Abdul Aziz University  
Uterine Transplant Team  
Jeddah, Saudi Arabia
Farina Dario
Center for Sensory-Motor Interaction (SMI)
Faculty of Engineering and Science
Department of Health Science and Technology
Aalborg University
Aalborg, Denmark

Fornara Serenella
Department of Psychiatry
San Gerardo Hospital
University of Milan-Bicocca
Monza, Milan, Italy

Gabl Markus
Department of Traumatology
Medical University
Innsbruck, Austria

Gazarian Aram
Clinique du Parc
Lyon, France

Genovese Umberto
Institute of Forensic Medicine and Insurance
University of Milan
Milan, Italy

Giacomozzi Claudia
Department of Technology and Health
Istituto Superiore di Sanità
Rome, Italy

Giannattasio Cristina
Department of Internal Medicine
Milano-Bicocca University and
San Gerardo Hospital
Monza, Milan, Italy

Giannantis Daniele
Department of Technology and Health
Istituto Superiore di Sanità
Rome, Italy

Giraux Pascal
Cognitive Science Institute
CNRS UMR
Bron, France

Granger Darla
Department of Surgery
University of Louisville
Louisville, KY, USA

Hofmann Gunther
Department of Traumatology and
Reconstructive Surgery
Friedrich Schiller University
Jena, Germany
Department of Traumatology and
Reconstructive Surgery
BG Kliniken Bergmannstrost
Halle, Germany

Hovius Steven E.R.
Department of Plastic and Reconstructive
Hand Surgery
Erasmus University
Medical Center Rotterdam
Rotterdam, The Netherlands

Kanatani Takako
Former Fellow
The Microsearch Foundation of Australia
Sydney, Australia
Rosai Hospital
Department of Orthopaedics
Kobe, Japan

Kanitakis Jean
Department of Dermatology
Édouard Herriot Hospital
Lyon, France

Kubitskiy Alexander
Microsearch Foundation of Australia
Sydney, Australia
AW Morrow Laboratory and
Collaborative Transplantation Group
Sydney University
Sydney, Australia

Kulahci Yalcin
Department of Plastic Surgery
The Cleveland Clinic Foundation
Cleveland, Ohio, USA
Lanzetta Marco  
Director, Italian Institute of Hand Surgery  
Monza, Milan, Italy  
Former Director, Hand Surgery and Reconstructive Microsurgery Unit  
San Gerardo Hospital  
Monza, Milan, Italy  
Former Associate Professor of Orthopaedics  
University of Milan-Bicocca  
Milan, Italy  
Adjunct Professor of Orthopaedics and Microsurgery  
University of Canberra, Australia  
President, International Hand and Composite Tissue Allograft Society

Lanzetta Paolo  
Department of Ophthalmology  
University of Udine  
Udine, Italy

Lascar Ioan  
“Carol Davila” Bucharest Medical University  
Clinic of Plastic Surgery and Reconstructive Microsurgery  
Bucharest Emergency Hospital  
Bucharest, Romania

Li Jian  
AW Morrow Laboratory and Collaborative Transplantation Group  
Sydney University  
Sydney, Australia

Lorenz Robert R.  
Section of Head and Neck Surgery  
Cleveland Clinic Lerner College of Medicine  
Case Western Reserve University  
The Cleveland Clinic Foundation  
Cleveland, Ohio, USA

Lucchina Stefano  
Former Clinical Fellow  
Hand Surgery and Microsurgery Unit  
San Gerardo Hospital  
Monza, Milan, Italy

Lucchini Giovanna  
Former Clinical Fellow  
Hand Surgery and Microsurgery Unit  
San Gerardo Hospital  
Monza, Milan, Italy

Lundborg Göran  
Department of Hand Surgery  
Malmö University Hospital  
Malmö, Sweden

Lutz Martin  
Department of Traumatology  
The Medical University  
Innsbruck, Austria

Maccioni Giovanni  
Department of Technology and Health  
Istituto Superiore di Sanità  
Rome, Italy

Macellari Velio  
Department of Technology and Health  
Istituto Superiore di Sanità  
Rome, Italy

Magni Francesca  
Italian Institute of Hand Surgery  
Monza, Milan, Italy

Maisano Paolo  
Department of Anaesthesia and Critical Care  
San Gerardo Hospital  
Monza, Milan, Italy

Margreiter Raimund  
Department of Transplant Surgery  
The Medical University  
Innsbruck, Austria

Martin Xavier  
Department of Transplantation  
Édouard Herriot Hospital  
Lyon, France

Martinez Ettore  
Department of Anaesthesia and Critical Care  
San Gerardo Hospital  
Monza, Milan, Italy
McCaughan Geoffrey W.
AW Morrow Laboratory and Collaborative Transplantation Group
Sydney University
Sydney, Australia

Menna Giuseppina
Territorial Forensic Science Laboratory of Lombardia
Milan, Italy

Molitor Martin
Department of Plastic and Aesthetic Surgery
University Hospital
Olomouc, Czech Republic

Morelli Sandra
Department of Technology and Health
Istituto Superiore di Sanità
Rome, Italy

Morelon Emmanuel
Department of Immunology and Renal Transplantation
Édouard Herriot Hospital
Claude Bernard Lyon 1 University
Lyon, France

Muramatsu Keiichi
Department of Orthopaedic Surgery
Yamaguchi University
School of Medicine
Ube, Yamaguchi, Japan

Ninkovic Marina
Physical Medicine and Rehabilitation Unit
The Medical University
Innsbruck, Austria

Ninkovic Milomir
Department of Plastic, Reconstructive and Hand Surgery
Burn Centre
Hospital Bogenhausen
Technical University of Munich
Munich, Germany

Nolli Roberta
Italian Institute of Hand Surgery
Monza, Milan, Italy

Noris Marina
Department of Medicine and Transplantation
Bergamo Hospital
Mario Negri Institute for Pharmacological Research
Bergamo, Italy

Paleari Felice
Diabetology Unit
San Gerardo Hospital
Monza, Milan, Italy

Paolizzi Mariano
Department of Technology and Health
Istituto Superiore di Sanità
Rome, Italy

Parmentier Hélène
Department of Orthopaedics of the Upper Limbs
Édouard Herriot Hospital
Lyon, France

Pechlaner Sigurd
Department of Traumatology
The Medical University
Innsbruck, Austria

Pei Guoxian
Department of Orthopaedic and Traumatology
Nanfang Hospital
The First Military Medical University
Guangzhou, P. R. China

Petruzzo Palmina
Department of Transplantation
Édouard Herriot Hospital
Lyon, France
Department of Surgery
University of Cagliari, Italy

Pioletti Pietro
Haematology Unit
San Gerardo Hospital
Monza, Milan, Italy

Piza Hildegunde
Department of Plastic and Reconstructive Surgery
The Medical University
Innsbruck, Austria
Pozzo Marco
Department of Physiology and Pharmacology
Section for Muscle and Exercise Physiology
Karolinska Institute
Stockholm, Sweden

Radaelli Ilaria
Italian Institute of Hand Surgery
Monza, Milan, Italy

Rampa Alessandro
Former Health Services Manager
San Gerardo Hospital
Monza, Milan, Italy

Remuzzi Giuseppe
Department of Medicine and Transplantation and
Transplant Research Center
Bergamo Hospital
Mario Negri Institute for Pharmacological Research
Bergamo, Italy

Rieger Michael
Department of Radiology
The Medical University
Innsbruck, Austria

Rosén Birgitta
Department of Hand Surgery
Malmö University Hospital
Malmö, Sweden

Rovati Luca
Plastic Surgery Unit
San Gerardo Hospital
Monza, Milan, Italy

Saini Maurizio
Department of Anaesthesia and Critical Care
San Gerardo Hospital
Monza, Milan, Italy

Scalamogna Mario
North Italian Transplant
Milan, Italy

Scarpis Paolo
Police Chief
Milan, Italy

Schieder Marc
Department of Neurology
University of Rochester
Rochester, USA

Schneeberger Stefan
Department of General and Transplant Surgery
Medical University
Innsbruck, Austria

Schuind Frédéric
Department of Orthopaedics and Traumatology
Erasme University Hospital
Medical School of the Université libre de Bruxelles
Bruxelles, Belgium

Sicard Didier
Department of Internal Medicine
University of Paris
Cochin Hospital
Paris, France

Siemionow Maria
Department of Plastic Surgery
The Cleveland Clinic Foundation
Cleveland, Ohio, USA

Sirigu Angela
Cognitive Science Institute
CNRS UMR
Bron, France

Stevens Jeroen J.P.D.
Department of Plastic and Reconstructive
Hand Surgery
Erasmus University Medical Center Rotterdam
Rotterdam, The Netherlands

Strome Marshall
The Head and Neck Institute
Cleveland Clinic Lerner College of Medicine
Case Western Reserve University
The Cleveland Clinic Foundation
Cleveland, Ohio, USA

Stroppa Luisa
Hand Therapy Unit
San Gerardo Hospital
Monza, Milan, Italy
Taguchi Toshihiko  
Department of Orthopaedic Surgery  
School of Medicine  
Yamaguchi University  
Yamaguchi, Japan

Tanaka Hiroshi  
Department of Orthopaedic Surgery  
School of Medicine  
Yamaguchi University  
Yamaguchi, Japan

Thaunat Olivier  
National Institute of Health and Medical Research  
Institute for Biomedical Research "Les Cordeliers"  
Pierre and Marie Curie University  
Paris, France

Uggeri Franco  
Department of Surgery  
San Gerardo Hospital  
University of Milan-Bicocca  
Milan, Italy

Urso Graziella  
The “Carrobiolo” Rehabilitation Centre  
Monza, Milan, Italy

Van Holder Carlo  
Department of Plastic Surgery  
OLV Lourdes Ziekenhuis  
Waregem, Belgium

Veritti Daniele  
Department of Ophthalmology  
University of Udine  
Udine, Italy

Vitale Giovanni  
Department of Anaesthesia and Critical Care  
San Gerardo Hospital  
Monza, Milan, Italy

Zamfirescu Dragos  
“Carol Davila” Bucharest Medical University  
Clinic of Plastic Surgery and  
Reconstructive Microsurgery  
Bucharest Emergency Hospital  
Bucharest, Romania

Zhao Jinmin  
Department of Orthopaedic Trauma  
and Hand Surgery  
The First Affiliated Hospital of  
Guangxi University  
Guangxi, P.R. China

Zuijdendorp H. Mischa  
Department of Plastic and Reconstructive  
Hand Surgery  
Erasmus University Medical Center Rotterdam  
Rotterdam, The Netherlands

Zuker Ronald M.  
Division of Plastic Surgery  
The Hospital for Sick Children  
Toronto, Ontario  
Canada