
Contents

Preface	v
Contributors	vii

REVIEWS

1 Principles of Membrane Electroporation and Transport of Macromolecules Eberhard Neumann, Sergej Kakorin, and Katja Toensing	1
2 Instrumentation and Electrodes for In Vivo Electroporation Gunter A. Hofmann	37
3 Numerical Modeling for In Vivo Electroporation Dejan Šemrov and Damijan Miklavčič	63
4 In Vitro Delivery of Drugs and Other Molecules to Cells Marie-Pierre Rols, Muriel Golzio, Christine Delteil, and Justin Teissié	83
5 The Basis of Electrochemotherapy Lluis M. Mir and Stéphane Orlowski	99
6 Electrochemotherapy: <i>Animal Model Work Review</i> Gregor Serša	119
7 Clinical Trials for Solid Tumors Using Electrochemotherapy Richard Heller, Richard Gilbert, and Mark J. Jaroszeski	137
8 In Vitro and Ex Vivo Gene Delivery to Cells by Electroporation Sek Wen Hui and Lin Hong Li	157
9 Delivery of Genes In Vivo Using Pulsed Electric Fields Mark J. Jaroszeski, Richard Gilbert, Claude Nicolau, and Richard Heller	173
10 Mechanism of Transdermal Drug Delivery by Electroporation Timothy E. Vaughan and James C. Weaver	187
11 Mechanistic Studies of Skin Electroporation Using Biophysical Methods Mark R. Prausnitz, Uwe Pliquett, and Rita Vanbever	213

ELECTROCHEMOTHERAPY PROTOCOLS

- 12 Treatment of Murine Transplanted Subcutaneous Tumors
Using Systemic Drug Administration
Stéphane Orlowski and Lluís M. Mir 247
- 13 Electrochemotherapy of Murine Melanoma Using Intratumor Drug
Administration
Richard Heller, Richard Gilbert, and Mark J. Jaroszeski 253
- 14 Treatment of a Tumor Model with ECT Using 4+4 Electrode
Configuration
Maja Cemažar 259
- 15 Treatment of Multiple Spontaneous Breast Tumors in Mice Using
Electrochemotherapy
Stéphane Orlowski and Lluís M. Mir 265
- 16 Electroporation of Muscle Tissue In Vivo
Julie Gehl and Lluís M. Mir 271
- 17 Treatment of Human Pancreatic Tumors Xenografted in Nude Mice
by Chemotherapy Combined with Pulsed Electric Fields
**Sukhendu B. Dev, Gunter A. Hofmann,
and Gurbinder S. Nanda 277**
- 18 Distribution of Bleomycin in a Rat Model
Per Engström, Leif G. Salford, and Bertil R. R. Persson 285
- 19 Treatment of Rat Bladder Cancer with Electrochemotherapy
In Vivo
Yoko Kubota, Teruhiro Nakada, and Isoji Sasagawa 293
- 20 Electrochemotherapy for the Treatment of Soft Tissue Sarcoma
in a Rat Model
Richard Gilbert, Mark J. Jaroszeski, and Richard Heller 299
- 21 Treatment of Spontaneous Soft Tissue Sarcomas in Cat
Stéphane Orlowski and Lluís M. Mir 305
- 22 Treatment of Rat Glioma with Electrochemotherapy
Leif G. Salford, Per Engström, and Bertil R. R. Persson 313
- 23 Treatment of Liver Malignancies with Electrochemotherapy
in a Rat Model
Mark J. Jaroszeski, Richard Gilbert, and Richard Heller 319
- 24 Treatment of Liver Tumors in Rabbit
Stéphane Orlowski and Lluís M. Mir 327

ELECTROGENETHERAPY PROTOCOLS

- 25 Electrically Mediated Reporter Gene Transfer into
Normal Rat Liver Tissue
**Mark J. Jaroszeski, Richard Gilbert, Claude Nicolau,
and Richard Heller** 333
- 26 Reporter/Functional Gene Transfer in Rat Brain
**Toru Nishi, Kimio Yoshizato, Tomoaki Goto, Hideo Takeshima,
Shigeo Yamashiro, Jun-ichi Kuratsu, Hideyuki Saya, and
Yukitaka Ushio** 339
- 27 In Vivo Gene Electroporation in the Mouse Testis
Tatsuo Muramatsu 349
- 28 Ex Vivo Stromal Cell Electroporation of Factor IX cDNA for
Treatment of Hemophilia B
**Armand Keating, Edward Nolan, Robin Filshie,
and Sukhendu B. Dev** 359
- 29 In Ovo Gene Electroporation into Early Chicken Embryos
Tatsuo Muramatsu 369

TRANSDERMAL DELIVERY PROTOCOLS

- 30 Electrical Impedance Spectroscopy for Rapid and Noninvasive
Analysis of Skin Electroporation
Uwe Pliquet and Mark R. Prausnitz 377
- 31 An In Vitro System for Measuring the Transdermal Voltage
and Molecular Flux Across the Skin in Real Time
Tani Chen, Robert Langer, and James C. Weaver 407
- 32 Using Surface Electrodes to Monitor the Electric-Pulse-Induced
Permeabilization of Porcine Skin
Stephen A. Gallo, Patricia G. Johnson, and Sek Wen Hui 437
- 33 Transdermal Delivery Using Surface Electrodes in Porcine Skin
Patricia G. Johnson, Stephen A. Gallo, and Sek Wen Hui 447
- 34 Transdermal Drug Delivery by Skin Electroporation in the Rat
Rita Vanbever and Véronique Préat 457
- 35 In Vivo Skin-Targeted Gene Delivery by Pulsed Electric Fields
Lei Zhang 473
- Index 489

Electrochemotherapy, Electrogenetherapy, and
Transdermal Drug Delivery
Electrically Mediated Delivery of Molecules to Cells
Jaroszeski, M.J. (Ed.)
2000, IX, 497 p., Hardcover
ISBN: 978-0-89603-606-2
A product of Humana Press