



## Contents

### Editorial

Bio-Electroporation 2013 – New biotechnological and clinical applications

D. Miklavčič, J. Teissié and E. Neumann . . . . . 1

### Original Articles

Emergence of a large pore subpopulation during electroporating pulses

K.C. Smith, R.S. Son, T.R. Gowrishankar and J.C. Weaver . . . . . 3

A molecular dynamic study of cholesterol rich lipid membranes: comparison of electroporation protocols

M. Casciola, D. Bonhenry, M. Liberti, F. Apollonio and M. Tarek . . . . . 11

Electroporation of archaeal lipid membranes using MD simulations

A. Polak, M. Tarek, M. Tomšič, J. Valant, N.P. Ulrih, A. Jamnik, P. Kramar and D. Miklavčič . . . . . 18

How medium osmolarity influences dielectrophoretically assisted on-chip electrofusion

F.S. Hamdi, O. Français, E. Dufour-Gergam and B. Le Pioufle . . . . . 27

Shock waves associated with electric pulses affect cell electro-permeabilization

L. Wasungu, F. Pillet, E. Bellard, M.-P. Rols and J. Teissié . . . . . 36

Testing a prototype pulse generator for a continuous flow system and its use for *E. coli* inactivation and microalgae lipid extraction

K. Flisar, S.H. Meglic, J. Morelj, J. Golob and D. Miklavcic . . . . . 44

Predicting electroporation of cells in an inhomogeneous electric field based on mathematical modeling and experimental CHO-cell permeabilization to propidium iodide determination

J. Dermol and D. Miklavčič . . . . . 52

Measurement and simulation of Joule heating during treatment of B-16 melanoma tumors in mice with nanosecond pulsed electric fields

U. Pliquett and R. Nuccitelli . . . . . 62

*In-vitro* bipolar nano- and microsecond electro-pulse bursts for irreversible electroporation therapies

M.B. Sano, C.B. Arena, M.R. DeWitt, D. Saur and R.V. Davalos . . . . . 69

600 ns pulse electric field-induced phosphatidylinositol<sub>4,5</sub>-bisphosphate depletion

G.P. Tolstykh, H.T. Beier, C.C. Roth, G.L. Thompson and B.L. Ibey . . . . . 80

Disassembly of actin structures by nanosecond pulsed electric field is a downstream effect of cell swelling

A.G. Pakhomov, S. Xiao, O.N. Pakhomova, I. Semenov, M.A. Kuipers and B.L. Ibey . . . . . 88

Doxorubicin delivery enhanced by electroporation to gastrointestinal adenocarcinoma cells with P-gp overexpression

J. Kulbacka, M. Daczewska, M. Dubińska-Magiera, A. Choromańska, N. Rembiałkowska, P. Surowiak, M. Kulbacki, M. Kotulska and J. Saczko . . . . . 96

Tissue damage modeling in gene electrotransfer: The role of pH N. Olaiz, E. Signori, F. Maglietti, A. Soba, C. Suárez, P. Turjanski, S. Michinski and G. Marshall . . . . .	105
Intramuscular electroporation of a P1A-encoding plasmid vaccine delays P815 mastocytoma growth G. Vandermeulen, C. Uyttenhove, E. De Plaen, B.J. Van den Eynde and V. Pr�at . . . . .	112
Changing electrode orientation, but not pulse polarity, increases the efficacy of gene electrotransfer to tumors <i>in vivo</i> V. Todorovic, U. Kamensek, G. Sersa and M. Cemazar . . . . .	119

## COST Statement

COST - European Cooperation in Science and Technology is an intergovernmental framework aimed at facilitating the collaboration and networking of scientists and researchers at European level. It was established in 1971 by 19 member countries and currently includes 35 member countries across Europe, and Israel as a cooperating state.

COST funds pan-European, bottom-up networks of scientists and researchers across all science and technology fields. These networks, called 'COST Actions', promote international coordination of nationally-funded research.

By fostering the networking of researchers at an international level, COST enables break-through scientific developments leading to new concepts and products, thereby contributing to strengthening Europe's research and innovation capacities.

COST's mission focuses in particular on:

- Building capacity by connecting high quality scientific communities throughout Europe and worldwide;
- Providing networking opportunities for early career investigators;
- Increasing the impact of research on policy makers, regulatory bodies and national decision makers as well as the private sector.

Through its inclusiveness, COST supports the integration of research communities, leverages national research investments and addresses issues of global relevance.

Every year thousands of European scientists benefit from being involved in COST Actions, allowing the pooling of national research funding to achieve common goals.

As a precursor of advanced multidisciplinary research, COST anticipates and complements the activities of EU Framework Programmes, constituting a "bridge" towards the scientific communities of emerging countries. In particular, COST Actions are also open to participation by non-European scientists coming from neighbour countries (for example Albania, Algeria, Armenia, Azerbaijan, Belarus, Egypt, Georgia, Jordan, Lebanon, Libya, Moldova, Montenegro, Morocco, the Palestinian Authority, Russia, Syria, Tunisia and Ukraine) and from a number of international partner countries. COST's budget for networking activities has traditionally been provided by successive EU RTD Framework Programmes. COST is currently executed by the European Science Foundation (ESF) through the COST Office on a mandate by the European Commission, and the framework is governed by a Committee of Senior Officials (CSO) representing all its 35 member countries.

More information about COST is available at [www.cost.eu](http://www.cost.eu).

