

International Journal of Experimental and Clinical Pathophysiology and Drug Research

Volume 31, Number 1, January-February 2017

Contents

Reviews

Pathophysiological Mechanisms of Renal Fibrosis: A Review of Animal Models and Therapeutic Strategies. A. NOGUEIRA, M.J. PIRES, P.A. OLIVEIRA (Vila Real; Bragança, Portugal)	1
Prevalence of EGFR Tyrosine Kinase Domain Mutations in Head and Neck Squamous Cell Carcinoma: Cohort Study and Systematic Review. C. PERISANIDIS (Vienna, Austria)	23
Clinical Factors Asssociated with Treatment Outcomes following Whole-brain Irradiation in Patients with Prostate Cancer. L. DZIGGEL, S.E. SCHILD, T. VENINGA, A. BAJROVIC, D. RADES (Lübeck; Hamburg, Germany; Scottsdale, AZ, USA; Tilburg, the Netherlands)	35
Experimental Studies	
Effectiveness of Analogs of the GS-Nitroxide, JP4-039, as Total Body Irradiation Mitigators. M.W. EPPERLY, J.R. SACHER, T. KRAINZ, X. ZHANG, P. WIPF, M. LIANG, R. FISHER, S. LI, H. WANG, J.S. GREENBERGER (Pittsburgh, PA, USA)	39
Active and Passive Immunization Against <i>Staphylococcus aureus</i> Periprosthetic Osteomyelitis in Rats. N.H.SØE, N.V. JENSEN, A.L. JENSEN, J. KOCH, S.S. POULSEN, G.B. PIER, H.K. JOHANSEN (Hellerup; Copenhagen; Hørsholm, Denmark; Boston, MA, USA)	45
Gene Expression Analysis of Cultured Rat-Endothelial Cells after Nd:YAG Laser Irradiation by Affymetrix GeneChip Array. Y. MASUDA, S. YOKOSE, H. SAKAGAMI (Saitama, Japan)	51
Wound Healing Delay in the ZDSD Rat. M.A. SUCKOW, T.A. GOBBETT, R.G. PETERSON (St. Paul, MN; Indianapolis, IN, USA)	55
Pulsed Electromagnetic Field Stimulation Promotes Anti-cell Proliferative Activity in Doxorubicin-treated Mouse Osteosarcoma Cells, Y. MURAMATSU, T. MATSUI, M. DEIF, K. SATO (Aichi, Japan)	61

Contents continued on the back cover



International Journal of Experimental and Clinical Pathophysiology and Drug Research

HighWire Press STANFORD UNIVERSITY

Editorial Board

I. ABRAHAM, Tucson, AZ, USA

N. J. AGNANTIS, Ioannina, Greece

D. ANDERSON, Bradford, West Yorkshire, UK

V. BARAK, Jerusalem, Israel

M. H. BARCELLOS-HOFF, New York, NY, USA

K. BEIER, Basel, Switzerland

M. BERGQVIST, Uppsala, Sweden

R. BJERKVIG, Bergen, Norway

W. BOWNE, Philadelphia, PA, USA

M. CARAGLIA, Naples, Italy

P. CHANDRA, Frankfurt am Main, Germany

J.-G. CHUNG, Taichung, Taiwan, ROC

L. A. COHEN, Northampton, MA, USA

A. I. CONSTANTINOU, Nicosia, Cyprus

T. DALIANIS, Stockholm, Sweden

G. DELICONSTANTINOS, Athens, Greece

D. T. DENHARDT, Bridgewater, NJ, USA

W. DEN OTTER, Amsterdam, The Netherlands

K. DE MEIRLEIR, Brussels, Belgium

L. DE RIDDER, Ghent, Belgium

E. P. DIAMANDIS, Toronto, ON, Canada

J.M. DRAKE, New Brunswick, NJ, USA

T. EFFERTH, Mainz, Germany

W. ENGSTRÖM, Uppsala, Sweden

M. ESKELINEN, Kuopio, Finland

J. A. FERNANDEZ-POL, Chesterfield, MO, USA

G. FIORENTINI, Pesaro, Italy

P. B. FISHER, New York, NY, USA

I. FREITAS, Pavia, Italy

M. FRIEDRICH, Krefeld, Germany

R. E. FRIEDRICH, Hamburg, Germany

R. GANAPATHI, Charlotte, NC, USA

G. GITSCH, Freiburg, Germany

J. S. GREENBERGER, Pittsburgh, PA, USA

J. W. GREINER, Bethesda, MD, USA

D. S. GRIDLEY, Loma Linda, CA, USA

 $\pmb{\text{C. J. GRUBBS,}} \ \textit{Birmingham, AL, USA}$

F. GUADAGNI, Rome, Italy

J. HAU, Copenhagen, Denmark

M. HAUER-JENSEN, Little Rock, AR, USA

K. HIBI, Kakamigahara, Japan

S. A. IMAM, Pasadena, CA, USA

K. S. JEONG, Daegu, S. Korea

M. JHANWAR-UNIYAL, Valhalla, NY, USA

I. KISS, Pécs, Hungary

E. KONDO, Niigata, Japan

M. KOUTSILIERIS, Athens, Greece

G. R. F. KRUEGER, Köln, Germany

B. KRUSLIN, Zagreb, Croatia

N. KYPRIANOU, Lexington, KY, USA

S. A. LAMPRECHT, New York, NY, USA

G. LANDBERG, Lund, Sweden

I. LELONG-REBEL, Illkirch, France

J. LEROY, Strasbourg, France

W. LICHTENEGGER, Berlin, Germany

 $\textbf{J. LYKKESFELDT,} \ \textit{Frederiksberg, Denmark}$

P. MADARNAS, Sherbrooke, QC, Canada

H. MAEDA, Kumamoto, Japan

M. MAREEL, Ghent, Belgium L. MARGOLIS, Bethesda, MD, USA

G. MARTORANA, Bologna, Italy

J. MOLNÁR, Szeged, Hungary

S.L. MOOBERRY, San Antonio, TX, USA

N. MOTOHASHI, Tokyo, Japan

R. M. NAGLER, Haifa, Israel

S. NAKANO, Fukuoka, Japan

M. NAKASHIMA, Nagasaki, Japan

R. NARAYANAN, Boca Raton, FL, USA

M.B. NICHOLL, San Antonio, TX, USA

K. NILSSON, Uppsala, Sweden

K. R. NORUM, Oslo, Norway

K. OGAWA, Tokyo, Japan

M. PAGÉ, Laval, QC, Canada

M.-F. POUPON, Paris, France

D. RADES, Lübeck, Germany

F. M. ROBERTSON, Richmond, VA, USA D. RUBELLO, Rovigo, Italy

C. A. RUBIO, Stockholm, Sweden

G. R. RUTTEMAN, Utrecht, The Netherlands

H. SAKAGAMI, Saitama, Japan

G. SAVA, Trieste, Italy

D. SCHIFFER, Vercelli, Italy

L. D. SHULTZ, Bar Harbor, ME, USA

G. SICA, Rome, Italy

J. SIEGFRIED, Minneapolis, MN, USA

J. SLANSKY, Denver, CO, USA

R. M. SNAPKA, Columbus, OH, USA

G.-I. SOMA, Kagawa, Japan

P. P. SORDILLO, New York, NY, USA

T. A. SPRINGER, Boston, MA, USA

D. D. SPYROPOULOS, Charleston, SC, USA

K. SYRJÄNEN, Helsinki, Finland

G. C. TORRE, Finale Ligure (SV), Italy

B. TRIBUKAIT, Stockholm, Sweden

J. VADGAMA, Los Angeles, CA, USA

J.K. VISHWANATHA, Fort Worth, TX, USA

N. WATANABE, Sapporo, Japan

W. WEBER, Basel, Switzerland

L. M. WEINER, Washington, DC, USA

J. A. WERNER, Marburg, Germany

S. YLÄ-HERTTUALA, Kuopio, Finland

H. YOSHIDA, Kagoshima, Japan

G. J. DELINASIOS, Athens, Greece
Managing Editor and Executive Publisher

Managing Editor and Executive Publisher

(1987-2016)

Editorial Office: journals@iiar-anticancer.org Managing Editor: editor@iiar-anticancer.org

For more information about IN VIVO, IIAR and the International Conferences of Anticancer Research, please visit the IIAR website: www.iiar-anticancer.org

Tel / Fax: +30-22950-53389. e-mail: journals@iiar-anticancer.org. **U.S. Branch**: Anticancer Research USA, Inc., 111 Bay Avenue, Highlands, NJ, 07732, USA. e-mail: journals@iiar-anticancer.org.

Editorial Office: International Institute of Anticancer Research, 1st km Kapandritiou-Kalamou Rd., Kapandriti, P.O. Box 22, Attiki 19014, Greece.

ISSN (print): 0258-851X, ISSN (online): 1791-7549

NJ, 07732, USA. e-mail: journals@iiar-anticancer.org.

General Policy: IN VIVO is a multidisciplinary journal designed to bring together original high quality works and reviews on experimental and clinical biomedical research within the framework of human physiology,

clinical biomedical research within the framework of human physiology, pathology and disease management. The special focus of the journal is the publication of works on: (a) Experimental development and application of new diagnostic procedures; (b) Pharmacological and toxicological evaluation of new drugs and drug combinations; (c) Clinical trials; (d) Development and characterization of models for biomedical research.

IN VIVO supports: (a) the activities of the INTERNATIONAL INSTITUTE OF ANTICANCER RESEARCH (IIAR; Kapandriti, Attiki, Greece) and (b) the organization of the International Conferences of Anticancer Research (www.iiar-anticancer.org).

Publication Data: IN VIVO is published bimonthly online-only and open access by the International Institute of Anticancer Research. Each annual volume comprises six issues. Annual Author and Subject Indexes are included in the sixth issue of each volume. IN VIVO Vol. 18 (2004) and onwards appears online with Stanford University HighWire Press. All published articles are deposited in PubMed Central.

Copyright: Authors retain copyright. The unrestricted non-commercial use, distribution and reproduction in any medium of IN VIVO articles for academic reasons is allowed, provided that the original work is properly cited. The Authors grant the permanent right to the publisher to use any articles published in this journal without any restriction, including academic advertising purposes. PDF, XML and HTML files of all articles published in IN VIVO are the property of the publisher.

Open Access Policy: Open Access Policy: IN VIVO appears bimonthly as an online-only open access journal through the Stanford University HighWire Press. Upon acceptance, Authors will be asked to contribute an online publication fee of US\$ 575 for articles up to 8 online pages (including figures and tables). Each additional excess page will be charged US\$ 58,00. Color will not be charged. Authors from developing countries may apply for a 25% discount after the acceptance of their paper. IN VIVO online will keep the volume, issue, and page numbering.

Articles in IN VIVO are regulary indexed in bibliographic services, including Index Medicus, PubMed, MEDLINE, Biological Abstracts, Chemical Abstracts, BIOSIS, Chemical Abstracts, Excerpta Medica, Elsevier Bibliographic Database, EMBASE, Compendex, GEOBASE, EMBiology, Elsevier BIOBASE, FLUIDEX, World Textiles, Scopus, CANCER-LIT Database, University of Sheffield Biomedical Information Service (SUBIS), Current Clinical Cancer, AIDS Abstracts, Progress in Paliative Care, Update-Research Information Systems Inc., Inpharma-Reactions Datastar, BRS), Reference Update (I.S.I.), Research Alert, Science Citation Index Expanded, Biochemistry & Biophysics Citation (I.S.I.), BioBase, MedBase, Google Scholar, Investigational Drugs Database, VINITI Abstracts Journal, PubsHub, SIIC Data Bases.

The Editors and Publishers of IN VIVO accept no responsibility for the opinions expressed by the contributors or for the content of advertisements appearing therein.

All correspondence status of submitted manuscripts, change of address, general editorial matters, advertising rate requests) should be addressed to the Editorial Office, e-mail: journals@iiar-anticancer.org. Articles should be submitted only through our online submission system (www.iiar-submissions.com).

Copyright© 2017, International Institute of Anticancer Research (Dr. George J. Delinasios), All rights reserved



International Journal of Experimental and Clinical Pathophysiology and Drug Research

ISSN (print): 0258-851X; ISSN (online): 1791-7549

Volume 31 2017

Editorial Board

- I. ABRAHAM, The HOPE Center, University of Arizona, Tucson, AZ, USA
- N.J. AGNANTIS, Department of Pathology, University of Ioannina, Ioannina, Greece
- D. ANDERSON, Department of Biomedical Sciences, University of Bradford, Bradford, West Yorkshire, UK
- V. BARAK, Department of Oncology, Hadassah University Hospital, Jerusalem, Israel
- M.H. BARCELLOS-HOFF, Department of Radiation Oncology, New York University School of Medicine, New York, NY, USA
- K. BEIER, Department of Histology, University of Basel, Basel, Switzerland
- M. BERGQVIST, Department of Oncology, Radiology and Clinical Immunology, University Hospital, Uppsala, Sweden
- R. BJERKVIG, Norlux Neuro-Oncology, Department of Biomedicine, University of Bergen, Bergen, Norway
- W. BOWNE, Department of Surgery, Drexel University College of Medicine, Philadelphia, PA, USA
- M. CARAGLIA, Department of Experimental Oncology, National Institute of Tumours Fondazione G. Pascale, Naples, Italy
- P. CHANDRA, Department of Molecular Biology, Frankfurt University, Frankfurt am Main, Germany
- J.-G. CHUNG, Department of Medicine, China Medical College, Taichung, Taiwan, ROC
- L.A. COHEN, Northamptom, MA, USA
- A.I. CONSTANTINOU, Department of Biological Sciences, University of Cyprus, Nicosia, Cyprus
- T. DALIANIS, Department of Pathology-Oncology, Karolinska Institute, Stockholm, Sweden
- G. DELICONSTANTINOS, Department of Experimental Physiology, University of Athens Medical School, Athens, Greece
- D.T. DENHARDT, Division of Life Sciences, Rutgers University, Bridgewater, NJ, USA
- W. DEN OTTER, VUMC Department of Urology, Amsterdam, The Netherlands
- **K. DE MEIRLEIR,** Department of Human Physiology and Medicine, Faculty of Physical Education and Physiotherapy, Vrije Universiteit Brussel, Brussels, Belgium
- L. DE RIDDER, Department of Anatomy, Embryology and Histology, University of Ghent, Ghent, Belgium
- E.P. DIAMANDIS, Department of Pathology and Laboratory Medicine, University of Toronto, Toronto, Ontario, Canada
- J.M. DRAKE, Division of Medical Oncology, RBHS-Robert Wood Johnson Medical School, Rutgers Cancer Institute of New Jersey, New Brunswick, NJ, USA
- T. EFFERTH, Department of Pharmaceutical Biology, Institute of Pharmacy and Biochemistry, University of Mainz, Germany
- W. ENGSTRÖM, Department of Molecular Biosciences, Swedish University of Agricultural Sciences, Uppsala, Sweden
- M. ESKELINEN, Department of Surgery, University Hospital of Kuopio, Kuopio, Finland
- J.A. FERNANDEZ-POL, Metalloproteomics, LLC, Chesterfield, MO, USA
- G. FIORENTINI, UOC Oncologia, Azienda Ospedaliera Marche Nord, Pesaro, Italy
- P.B. FISHER, Virginia Commonwealth University, School of Medicine, Richmond, VA, USA
- I. FREITAS, Dipartimento di Biologia Animale, University of Pavia, Pavia, Italy
- M. FRIEDRICH, Department of Obstetrics and Gynecology, Klinikum Krefeld, Krefeld, Germany
- R.E. FRIEDRICH, Department of Oral and Maxillofacial Surgery, Eppendorf University Hospital, Hamburg, Germany
- R. GANAPATHI, Levine Cancer Institute, Carolinas HealthCare System, Charlotte, NC, USA
- G. GITSCH, Department of Gynecology and Obstetrics, University of Freiburg Medical Center, Freiburg, Germany
- J.S. GREENBERGER, Department of Radiation Oncology, University of Pittsburgh, Pittsburgh, PA, USA
- J.W. GREINER, National Cancer Insitute, NIH, Bethesda, MD, USA
- D.S. GRIDLEY, Department of Radiation Medicine, Radiation Research Laboratories, Loma Linda University and Medical Center, Loma Linda, CA, USA
- C.J. GRUBBS, Department of Nutrition Sciences, University of Alabama, Birmingham, AL, USA
- F. GUADAGNI, IRCCS San Raffaele, Rome, Italy

- J. HAU, Department of Comparative Medicine, University of Copenhagen, Denmark
- M. HAUER-JENSEN, Arkansas Cancer Research Center, University of Arkansas Medical Sciences, Little Rock, AR, USA
- K. HIBI, Tokai Central Hospital, Kakamigahara, Gifu, Japan
- S.A. IMAM, Huntington Medical Research Institutes, Gene Therapy Program, Pasadena, CA, USA
- K.S. JEONG, Department of Pathology, College of Veterinary Medicine, Kyungpook National University, Daegu, S. Korea
- M. JHANWAR-UNIYAL, Department of Neurosurgery, New York Medical College, Valhalla, NY, USA
- I. KISS, Institute of Preventive Medicine, Medical School, University of Pécs, Pécs, Hungary
- E. KONDO, Division of Molecular and Cellular Pathology Niigata University Graduate School of Medical and Dental Sciences, Chuo-ku, Niigata, Japan
- M. KOUTSILIERIS, Department of Experimental Physiology, University of Athens Medical School, Athens, Greece
- G.R.F. KRUEGER, Department of Anatomy II, Center for Anatomy, The University of Cologne Medical School, Cologne, Germany
- B. KRUSLIN, Department of Pathology, Ljudevit Jurak University, Sestre milosrdnice University Hospital, Zagreb, Croatia
- N. KYPRIANOU, Department of Urology, University of Kentucky, Lexington, KY, USA
- S.A. LAMPRECHT, Division of Clinical Biochemistry, Faculty of Health Sciences, Ben Gurion University of the Negev, Beer-Sheva, Israel
- G. LANDBERG, Department of Laboratory Medicine, Lund University, Lund, Sweden
- I. LELONG-REBEL, Lab. de Biophotonique et Pharmacologie, Université de Strasbourg, Illkirch, France
- J. LEROY, IRCAD, University of Strasbourg, France
- W. LICHTENEGGER, Charité Campus Virchow-Klinikum, Berlin, Germany
- J. LYKKESFELDT, Department of Veterinary Disease Biology, University of Copenhagen, Frederiksberg, Denmark
- P. MADARNAS, Department of Pathology, University of Sherbrooke, Québec, Canada
- H. MAEDA, Faculty of Pharmaceutical Sciences, Sojo University, Kumamoto, Japan
- M. MAREEL, Laboratory of Experimental Cancerology, State University, Ghent, Belgium
- L. MARGOLIS, Eunice Kennedy Shriver National Institute of Child Health and Human Development, Bethesda, MD, USA
- G. MARTORANA, Policlinico S. Orsola Malpighi, University of Bologna, Bologna, Italy
- J. MOLNÁR, Department of Medical Microbiology and Immunobiology, Faculty of Medicine, University of Szeged, Szeged, Hungary
- S.L. MOOBERRY, Cancer Therapy & Research Center, University of Texas Health Science Center at San Antonio, San Antonio, TX, USA
- N. MOTOHASHI, Department of Medicinal Chemistry, Meiji Pharmaceutical University, Tokyo, Japan
- R.M. NAGLER, Department of Oral and Maxillofacial Surgery, Rambam Medical Center, Haifa, Israel
- S. NAKANO, Graduate School of Health and Nutritional Sciences, Nakamura Gakuen University, Fukuoka, Japan
- M. NAKASHIMA, Department of Tumor and Diagnostic Pathology, Atomic Bomb Disease Institute, Nagasaki University, Nagasaki, Japan
- R. NARAYANAN, Department of Biological Sciences, Florida Atlantic University, Boca Raton, FL, USA
- M.B. NICHOLL. South Texas Veterans Health Care Sustem. San Antonio. TX. USA
- K. NILSSON, Tumor Biology Laboratory, Department of Pathology, University Hospital, Uppsala, Sweden
- K.R. NORUM, Institute for Nutrition Research, University of Oslo, Oslo, Norway
- K. OGAWA, Department of Surgery, Tokyo Women's Medical University Medical Center East, Tokyo, Japan
- M. PAGÉ, Département de Biologie, Division de Biochimie, Universiti Laval, Québec, Canada
- M.-F. POUPON, Institut Curie, Section de Recherche, Paris, France
- D. RADES, Department of Radiation Oncology, University of Lübeck, Lübeck, Germany
- F.M. ROBERTSON, Virginia Commonwealth University, Clinical Research Services, Center for Clinical and Translational Research, Richmond Academy of Medicine, Richmond, VA, USA

in vivo 31: (2017)

- D. RUBELLO, Department of Nuclear Medicine, PET Unit, S. Maria della Misericordia Hospital, IOV, Rovigo, Italy
- C.A. RUBIO, Karolinska Institute, Pathology Research Laboratory, Stockholm, Sweden
- G.R. RUTTEMAN, Department of Clinical Sciences of Companion Animals, University of Utrecht, Utrecht, The Netherlands
- H. SAKAGAMI, Department of Dental Pharmacology, Meikai University School of Dentistry, Saitama, Japan
- G. SAVA, Institutes of Biological Research, Fondazione Callerio-Onlus, Trieste, Italy
- D. SCHIFFER, Neuro-bio-oncology Center, Policlinico di Monza Foundation, University of Turin, Vercelli, Italy
- L.D. SHULTZ, The Jackson Laboratory, Bar Harbor, ME, USA
- G. SICA, Istituto di Istologia ed Embriologia, Universita Cattolica del Sacro Cuore, Roma, Italy
- J.M. SIEGFRIED, Department of Pharmacology, MNPI Center, University of Minnesota, Minneapolis, MN, USA
- J. SLANSKY, Integrated Department of Immunology, School of Medicine, University of Colorado Denver and National Jewish Health. Denver. CO. USA
- R.M. SNAPKA, Department of Radiology, The Ohio State University, Columbus, OH, USA
- G.-I. SOMA, Department of Integrated and Holistic Immunology, Faculty of Medicine, Kagawa University, Kagawa, Japan
- P.P. SORDILLO, Department of Medical Oncology and Hematology, Lenox Hill Hospital, New York, NY, USA
- T.A. SPRINGER, Department of Pathology, Harvard Medical School, Boston, MA, USA
- D.D. SPYROPOULOS, Department of Pathology and Laboratory Medicine, Medical University of South Carolina, Charleston, SC, USA
- K. SYRJÄNEN, Biohit Healthcare Oyj, Helsinki, Finland
- G.C. TORRE, Centro Ippocrate, Vico Cosmelli 4, Finale Ligure (SV), Italy
- B. TRIBUKAIT, Department of Medical Radiobiology, Karolinska Hospital, Stockholm, Sweden
- J. VADGAMA, Department of Internal Medicine, Charles E. Drew University of Medicine and Science, Los Angeles, CA, USA
- J.K. VISHWANATHA, Graduate School of Biomedical Sciences, University of North Texas Health Science Center, Fort Worth, TX, USA
- N. WATANABE, Department of Clinical Laboratory Medicine, Sapporo Medical University School of Medicine, Sapporo, Japan W. WEBER, Clinical Cancer Etiology Unit, Basel, Switzerland
- L.M. WEINER, Lombardi Comprehensive Cancer Center, Georgetown University Medical Center, Washington, DC, USA
- J.A. WERNER, Department of Otolaryngology, Head and Neck Surgery, Marburg, Germany
- S. YLÄ-HERTTUALA, Department of Molecular Medicine, A.I. Virtanen Institute, University of Kuopio, Finland
- H. YOSHIDA, Department of Pathology, Kagoshima University, Kagoshima, Japan

Acknowledgements

The following Organisations supported many of the works published in IN VIVO, Volume 30, 2016.

A.J. Andersen Foundation, Denmark

A.P. Møller Foundation, Denmark

Assisted Reproduction Units of the 3rd Department of Obstetrics and Gynecology, Attikon Hospital, Athens, Greece

Association Research, Ghent University, Gent, Belgium AstraZeneca, London, U.K.

Atherosclerosis and Atherothrombosis Group, Romanian Society of Cardiology, Romania

BIOX Foundation, Germany

Bower Foundation, Ridgeland, MS, U.S.A.

Bundesministerium für Bildung und Forschung (BMBF), Germany

Cancellautismo, Italy

Cell Sorting Core Facility, Medizinische Fakultät Mannheim -Universität Heidelberg, Mannheim, Germany

Chang Bing Show Chwan Memorial Hospital, Lukang, Taiwan, R.O.C.

China Medical University Hospital, Taichung, Taiwan, R.O.C. Chonnam National University Hospital Biomedical Research

Institute, Taiwan, R.O.C.

Chungbuk Technopark, Republic of Korea

Colorado State University, Fort Collins, CO, U.S.A.

Conselho Nacional de Desenvolvimento Científico e Tecnologico (CNPq), Brasilia, Brazil

Council for Science, Technology and Innovation (CSTI), Tokyo, Japan

Cross-ministerial Strategic Innovation Promotion Program (SIP), Japan

Danish Crohn and Colitis Foundation (CCF), Denmark

Department of Biochemistry & Biotechnology, University of Thessaly, Larisa, Greece

Department of Electrophysiology, Medical School University of Pécs, Pécs, Hungary

Department of Pathology, University of Crete Medical School, Heraklion, Greece

Department of Pediatrics, University of Mississippi Medical Center, Jackson, MS, U.S.A.

Department of Toxicology, School of Public Health, Central-South University, Changsha, P.R. China

Deutsche Forschungsgemeinschaft (DFG), Bonn, Germany Division of Fixed Prosthodontics, Meikai University School of Dentistry, Urayasu, Japan Eleventh Five-year Plan Project of the People's Liberation Army, P.R. China

European Investment Funds, Luxembourg

European Social Fund (ESF), European Commission, Brussels, Belgium

Fishery Commercialization Technology Development Program, Ministry for Food, Agriculture, Forestry and Fisheries, Republic of Korea

Fundação Amazônia Paraense do Estado do Pará (FAPESPA), São Paulo, Brazil

Fundação de Apoio ao Ensino, Pesquisa e Assistência (FAEPA), Ribeirão Preto, Brazil

Fundação para a Ciência e a Tecnologia (FCT), Ministério da Ciência e Ensino Superior, Portugal

Fundo Europeu do Desenvolvimento Regional (FEDER), Portugal

GerontoSys, Jülich, Germany

Godley-Snell Research Center, Clemson University, Clemson, SC, U.S.A.

Grant-in-Aid for Challenging Exploratory Research, Ministry of Education, Culture, Sports, Science and Technology (MEXT), Tokyo, Japan

Grants-in-Aid for Scientific Research (KAKENHI), Japanese Society for the Promotion of Science, Tokyo, Japan

Hogeschool Gent, Gent, Belgium

Instituto de Patologia e Imunologia Molecular da Universidade do Porto (IPATIMUP), Porto, Portugal

IVF Unit, Third Department of Obstetrics and Gynecology, Athens University School of Medicine, Attikon Hospital, Athens, Greece

Iwate University, Morioka, Japan

János Bolyai Research Scholarship, Hungarian Academy of Sciences, Budapest, Hungary

King's College, London, U.K.

Kyulan Family Foundation, Austin, TX, U.S.A.

La Forza del Silenzio, San Cipriano d'Aversa, Italy Laboratories of LURE, Centre Universitaire, Paris-Sud, France

Lancet, London, U.K.

Mahidol University, Salaya, Thailand

MedAustran Centre, Wiener Neustadt, Austria

Medical & Health Research Grant, Hangzhou Yuhang District, P.R. China

Ministry of Education, Culture, Sports, Science and Technology (MEXT), Tokyo, Japan

Ministry of Health and Welfare, Taipei, Taiwan, R.O.C.

Ministry of Science and Technology, Taipei, Taiwan, R.O.C.

Ministry of Science, Technology and Higher Education, Portugal

Miyata Research Fund B, Meikai University, Urayasu, Japan

Naito Foundation, Japan

National Center of Excellence for Clinical Trials and Research Center, Taiwan, R.O.C.

National Institute of General Medical Sciences (NIGMS), National Institutes of Health, Bethesda, MD, USA

National Science Centre, Kraków, Poland

North Carolina University, Chapel Hill, NC, U.S.A.

Ohio State University, Columbus, OH, U.S.A.

Olympus Bioimaging Center, Faculty of Science, Mahidol University, Salaya, Thailand

Operational Competitiveness and Internationalization Program, Portugal

Parteneriate în Cercetarea Fundamentală Inovativă Grant, Victor Babes University of Medicine and Pharmacy, Timisoara, Romania

Pennsylvania State System of Higher Education, Harrisburg, PA, U.S.A.

Program for New Century Excellent Talents in University, Ministry of Education of the People's Republic of China, Beijing, P.R. China

Programa Operacional Temático de Factores de Competitividade (POFC) - COMPETE, Portugal

Sava Perovic Foundation, Belgrade, Serbia School of Dentistry, Meikai University, Urayasu, Japan Scientific Research Projects Coordination Unit, Istanbul University, Istanbul, Turkey

Scientific Research Projects, Istanbul University, Istanbul, Turkey

Second Department of Anesthesiology, National and Kapodistrian University of Athens, Athens, Greece

Shizuoka Prefectural Research Institute of Animal Industry, Swine and Poultry Research Center, Shizuoka, Japan

Shizuoka Prefectural Toubu Public Center, Shizuoka, Japan

Shizuoka University, Shizuoka, Japan

Spintec Engineering, Aachen, Germany

State of Hungary

Stichting Emmanuel van der Schueren, Kom op tegen Kanker, Brussels, Belgium

Sumitomo Foundation, Japan

Szeged Foundation for Cancer Research, Szeged, Hungary

Taichung Armed Force General Hospital, Taichung, Taiwan, R.O.C.

Takeda Science Foundation, Osaka, Japan

TE-Bios Company, Ochang, Republic of Korea

Technologies for Creating Next-generation Agriculture,

Forestry and Fisheries, SIP, Japan

Thailand Research Fund, Thailand

Tianjin Hope Industry&Trade Co., Ltd., Tianjin, P.R. China

Tissue Bank, China Medical University Hospital, Taichung, Taiwan, R.O.C.

TTY Biopharma, Taipei, Taiwan, R.O.C.

Universitätsmedizin Mannheim, Mannheim, Germany University of Michigan Medical School, Ann Arbor, MI, U.S.A.

University of Minnesota, Minneapolis, MN, U.S.A.

University of Pécs, Pécs, Hungary

University of Pennsylvania Medical Center, Philadelphia, PA, U.S.A.

University of Rostock, Rostock, Germany

University of Tokyo, Tokyo, Japan

University of Veterinary Medicine Vienna, Wien, Austria

Victor Babes University of Medicine and Pharmacy, Timisoara, Romania

Wroclaw Medical University, Wroclaw, Poland

Yamaguchi University, Yamaguchi, Japan

Instructions for Authors 2017

General Policy. IN VIVO is a multidisciplinary journal designed to bring together original high quality works and reviews on experimental and clinical biomedical research within the frames of human physiology, pathology and disease management. A special focus of the journal is the publication of works on: (a) Experimental development and application of new diagnostic procedures; (b) Pharmacological and toxicological evaluation of new drugs and drug combinations; (c) Clinical trials; (d) Development and characterization of models of biomedical research. The principal aim of IN VIVO is to provide prompt online publication for accepted articles, generally within 1-2 months from final acceptance.

Manuscripts will be accepted on the understanding that they report original unpublished works that are not under consideration for publication by another journal, and that they will not be published again in the same form. All authors should sign a submission letter confirming the approval of their article contents. All material submitted to IN VIVO will be subject to peer-review, when appropriate, by two members of the Editorial Board. All manuscripts submitted to IN VIVO are urgently treated with absolute confidence, with access restricted to the Managing Editor, the journal's secretary, the reviewers and the printers. The Editors reserve the right to improve manuscripts on grammar and style.

The use of animals in biomedical research should take place under careful supervision of a person adequately trained in this field and the animals must be treated humanely at all times. Such research should adhere to the Guiding Principles in the Care and Use of Animals approved by the Council of the American Physiological Society.

The Editors and Publishers of IN VIVO accept no responsibility for the contents and opinions expressed by the contributors. Authors should warrantee due diligence in the creation and issuance of their work.

Open Access Policy. IN VIVO appears bimonthly as an online-only open access journal through the Stanford University HighWire Press. Upon acceptance, Authors will be asked to pay an online publication fee of USD 575.00 for articles up to 8 online pages (including figures and tables). Each additional excess page will be charged USD 58.00. Color will not be charged. Authors from developing countries may apply for a 25% discount after the acceptance of their paper. IN VIVO online will keep the volume and issue numbers, as well as page numbering.

Copyright. Authors retain copyright. The unrestricted non-commercial use, distribution and reproduction in any medium of IN VIVO articles for academic reasons is allowed, provided that the original work is properly cited. The Authors grant the permanent right to the publisher to use any articles published in this journal without any restriction, including academic advertising purposes. PDF, XML and html files of all articles published in IN VIVO are the property of the publisher.

Format. Two types of papers may be submitted: (i) Full papers containing completed original work, and (ii) review articles concerning fields of recognisable progress. Papers should contain all essential data in order to make the presentation clear. Papers should be written in clear, concise English. Spelling should follow that given in the "Shorter Oxford English Dictionary".

Manuscripts. Manuscripts should be divided into the following sections: (a) First page including the title of the presented work [not exceeding fifteen (15) words], full names and full postal addresses of all Authors, name of the Author to whom proofs are to be sent, key words, an abbreviated running title, an indication "review", "clinical", "epidemiological", or "experimental" study, and the date of submission. (Note: The order of the Authors is not necessarily indicative of their contribution to the work. Authors may note their individual contribution(s) in the appropriate section(s) of the presented work); (b) Abstract not exceeding 150 words, organized according to the following headings: Background/Aim – Materials and Methods/Patients and Methods – Results – Conclusion; (c) Introduction; (d) Materials and Methods/Patients and Methods; (e) Results; (f) Discussion; (g) Acknowledgements; (h) References. All pages must be numbered consecutively. Footnotes should be avoided. Review articles may follow a different style according to the subject matter and the Author's opinion. Review articles should not exceed 35 pages (approximately 250 words per double-spaced typed page) including all tables, figures, and references.

Figures. All figures should appear at the end of the submitted document file. Once a manuscript is accepted all figures and graphs should be submitted separately in either jpg, tiff or pdf format and at a minimum resolution of 300 dpi. Graphs must be submitted as pictures made from drawings and must not require any artwork, typesetting, or size modifications. Symbols, numbering and lettering should be clearly legible. The number and top of each figure must be indicated. Pages that include color figures are not subject to color charges.

Tables. All tables should appear **at the end** of the submitted document file. Once a manuscript is accepted, each table should be submitted separately, typed double-spaced. Tables should be numbered with Roman numerals and should include a short title.

References. Authors must assume responsibility for the accurancy of the references used. Citations for the reference sections of submitted works should follow the standard form of "Index Medicus" and must be numbered consecutively. In the text, references should be cited by number. Examples: 1 Sumner AT: The nature of chromosome bands and their significance for cancer research. Anticancer Res 1: 205-216, 1981. 2 McGuire WL and Chamnes GC: Studies on the oestrogen receptor in breast cancer. In: Receptors for Reproductive Hormones (O' Malley BW, Chamnes GC (eds.). New York, Plenum Publ Corp., pp 113-136, 1973.

Nomenclature and Abbreviations. Nomenclature should follow that given in "Chemical Abstracts", "Index Medicus", "Merck Index", "IUPAC -IUB", "Bergey's Manual of Determinative Bacteriology", The CBE Manual for Authors, Editors and Publishers (6th edition, 1994), and MIAME Standard for Microarray Data. Human gene symbols may be obtained from the HUGO Gene Nomenclature Committee (HGNC) (http://www.gene.ucl.ac.uk/). Approved mouse nomenclature may be obtained from http://www.informatics.jax.org/. Standard abbreviations are preferable. If a new abbreviation is used, it must be defined on first usage.

Clinical Trials. Authors of manuscripts describing clinical trials should provide the appropriate clinical trial number in the correct format in the text.

For International Standard Randomised Controlled Trials (ISRCTN) Registry (a not-for-profit organization whose registry is administered by Current Controlled Trials Ltd.) the unique number must be provided in this format: ISRCTNXXXXXXXX (where XXXXXXXX represents the unique number, always prefixed by "ISRCTN"). Please note that there is no space between the prefix "ISRCTN" and the number. Example: ISRCTN47956475.

For Clinicaltrials.gov registered trials, the unique number must be provided in this format: NCTXXXXXXXX (where XXXXXXXX represents the unique number, always prefixed by "NCT"). Please note that there is no space between the prefix "NCT" and the number. Example: NCT00001789.

Ethical Policies and Standards. IN VIVO agrees with and follows the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" established by the International Committee of Medical Journal Editors in 1978 and updated in October 2001 (www.icmje.org). Microarray data analysis should comply with the "Minimum Information About Microarray Experiments (MIAME) standard". Specific guidelines are provided at the "Microarray Gene Expression Data Society" (MGED) website. Presentation of genome sequences should follow the guidelines of the NHGRI Policy on Release of Human Genomic Sequence Data. Research involving human beings must adhere to the principles of the Declaration of Helsinki and Title 45, U.S. Code of Federal Regulations, Part 46, Protection of Human Subjects, effective December 13, 2001. Research involving animals must adhere to the Guiding Principles in the Care and Use of Animals approved by the Council of the American Physiological Society. The use of animals in biomedical research should be under the careful supervision of a person adequately trained in this field and the animals must be treated humanely at all times. Research involving the use of human foetuses, foetal tissue, embryos and embryonic cells should adhere to the U.S. Public Law 103-41, effective December 13, 2001.

Submission of Manuscripts. Please follow the Instructions for Authors regarding the format of your manuscript and references. Manuscripts must be submitted only through our online submission system at: http://www.iiar-submissions.com/login.html In case a submission is incomplete, the corresponding Author will be notified accordingly.

Questions regarding difficulties in using the online submission system should be addressed to: email: journals@iiar-anticancer.org

Galley Proofs. Unless otherwise indicated, galley proofs will be sent to the corresponding Author of the submission. Corrections of galley proofs should be limited to typographical errors. Galley proofs should be returned corrected to the Editorial Office by email within two days.

Specific information and additional instructions for Authors

- 1. In Vivo (IV) will consider the publication of conference proceedings and/or abstracts provided that the material submitted fulfils the quality requirements and instructions of the journal, following the regular review process by two suitable referees.
- 2. An acknowledgement of receipt, including the article number, title and date of receipt is sent to the corresponding author of each manuscript upon receipt. If this receipt is not received within 20 days from submission, the author should call or write to the Editorial Office to ensure that the manuscript (or the receipt) was not lost in the mail.
- 3. Each manuscript submitted to IV is sent for review in confidence to two suitable referees with the request to return the manuscript with their comments to the Editorial Office within 12 days from receipt. If reviewers need a longer time or wish to send the manuscript to another expert, the manuscript may be returned to the Editorial Office with a delay. All manuscripts submitted to IV, are treated in confidence, without access to any person other than the Managing Editor, the journal's secretary, the reviewers and the printers.

- 4. All accepted manuscripts are peer-reviewed and carefully corrected in style and language, if necessary, to make presentation clear. (There is no fee for this service). Every effort is made (a) to maintain the personal style of the author's writing and (b) to avoid change of meaning. Authors will be requested to examine carefully manuscripts which have undergone language correction at the pre-proof or proof stage.
- 5. Authors should pay attention to the following points when writing an article for IN VIVO:
 - The Instructions to Authors must be followed in every detail.
 - The presentation of the experimental methods should be clear and complete in every detail facilitating reproducibility by other scientists.
 - The presentation of results should be simple and straightforward in style. Results and discussion should not be combined into one section, unless the paper is short.
 - Results given in figures should not be repeated in tables.
 - Figures (graphs or photographs) should be prepared at a width of 8 or 17 cm with legible numbers and lettering.
 - Photographs should be clear with high contrast, presenting the actual observation described in the legend and in the text. Each
 legend should provide a complete description, being self-explanatory, including technique of preparation, information about the
 specimen and magnification.
 - Statistical analysis should be elaborated wherever it is necessary. Simplification of presentation by giving only numerical or % values should be avoided.
 - Fidelity of the techniques and reproducibility of the results, should be points of particular importance in the discussion section.
 Authors are advised to check the correctness of their methods and results carefully before writing an article. Probable or dubious explanations should be avoided.
 - Authors should not cite results submitted for publication in the reference section. Such results may be described briefly in the text with a note in parenthesis (submitted for publication by... authors, year).
 - The References section should provide as complete a coverage of the literature as possible including all the relevant works
 published up to the time of submission.
 - By following these instructions, Authors will facilitate a more rapid review and processing of their manuscripts and will provide the readers with concise and useful papers.
- Following review and acceptance, a manuscript is examined in language and style, and galley proofs are rapidly prepared. Second proofs are not sent unless required.
- 7. Authors should correct their galley proofs very carefully and preferably twice. An additional correction by a colleague always proves to be useful. Particular attention should be paid to chemical formulas, mathematical equations, symbols, medical nomenclature etc. Any system of correction marks can be used in a clear manner, preferably with a red pen. Additions or clarifications are allowed provided that they improve the presentation but do not bring new results (no fee).
- 8. Articles submitted to IN VIVO may be rejected without review if:
 - they do not fall within the journal's policy.
 - they do not follow the instructions for authors.
 - language is unclear.
 - results are not sufficient to support a final conclusion.
 - results are not objectively based on valid experiments.
 - they repeat results already published by the same or other authors before the submission to IV.
 - plagiarism is detected by plagiarism screening services. (Rejection rate (2016): 59%).
- 9. Authors who wish to prepare a review should contact the Managing Editor of the journal in order to get confirmation of interest in the particular topic of the review and to allow programming of space availability. The expression of interest by the Managing Editor does not necessarily imply acceptance of the review by the journal.
- 10. Authors may inquire information about the status of their manuscript(s) by calling the Editorial Office at +30-22950-53389, Monday to Friday 9.00-16.00 (Athens time), or by sending an e-mail to journals@iiar-anticancer.org.
- 11. Authors who wish to edit a special issue on a particular topic should contact the Managing Editor.

 (This text is a combination of advice and suggestions contributed by Editors, Authors, Readers and the Managing Editor of IV).

Copyright© 2017 – International Institute of Anticancer Research (G.J. Delinasios). All rights reserved (including those of translation into other languages). No part of this journal may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, microfilming, recording or otherwise, without written permission from the Publisher.

