

in vivo

International Journal of Experimental and Clinical Pathophysiology and Drug Research

Volume 27, Number 1, January-February 2013

Contents

Reviews

- Breast Cancer: Mechanisms Involved in Action of Phytoestrogens and Epigenetic Changes. A. DAGDEMIR, J. DURIF, M. NGOLLO, Y.-J. BIGNON, D. BERNARD-GALLON (*Clermont-Ferrand, France*)..... 1

Experimental Studies

- Effects of Minocycline on Hematopoietic Recovery after Whole-body Irradiation. S. MEHROTRA, M.J. PECAUT, D.S. GRIDLEY (*Loma Linda, CA, USA*)..... 11
- Diverging *In Vitro* Antibody Isotype Switching Preference in B-Lymphocytes from C57BL/6 and FVB Mice. A.G. PUTHIYAVEETIL, B. OKYERE, C.M. REILLY, D. CAUDELL (*Blacksburg, VA, USA*)..... 29
- Biocompatibility of Membranes with Unrestricted Somatic Stem Cells. C. NAUJOKS, F. PAULßEN VON BECK, F. LANGENBACH, M. HENTSCHEL, K. BERR, M. HOFER, R. DEPPRICH, N. KÜBLER, J. HANDSCHEL (*Düsseldorf, Germany*)..... 41
- Catecholamines Reduce Dose-dependent Oedema Formation and Inflammatory Reaction in an Isolated Rat Lung Model. C. DACHO, A. DACHO, A. GEISLER, C. HAUSER, K. NOWAK, G. BECK (*Mannheim; Essen; Wiesbaden, Germany*)..... 49
- Cytogenetic Analysis of a Low-grade Secondary Peripheral Chondrosarcoma Arising in Synovial Chondromatosis. A.I. KYRIAZOGLU, H. RIZOU, E. DIMITRIADIS, N. ARNOGIANNAKI, N. AGNANTIS, N. PANDIS (*Athens; Ioannina, Greece*)..... 57
- Everolimus Dual Effects of an *Area Vasculosa* Angiogenesis and Lymphangiogenesis. R.A. CEAUŞU, A.M. CIMPEAN, I. DIMOVA, R. HLUSHCHUK, V. DJONOV, P.N. GAJE, M. RAICA (*Timișoara, Romania; Bern, Switzerland; Sofia, Bulgaria*)..... 61

Contents continued on the back cover



Editorial Board

- N. J. AGNANTIS, Ioannina, Greece
D. ANDERSON, Bradford, West Yorkshire, UK
J.P.A. BAAK, Stavanger, Norway
V. BARAK, Jerusalem, Israel
M. H. BARCELLOS-HOFF, New York, NY, USA
Y. BECKER, Jerusalem, Israel
K. BEIER, Basel, Switzerland
S. BEN-EFRAIM, Tel-Aviv, Israel
M. BERGQVIST, Uppsala, Sweden
R. BJERKVIG, Bergen, Norway
B. BODEY, Reseda, CA, USA
D. A. BUTTERFIELD, Lexington, KY, 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
T. EFFERTH, Mainz, Germany
I. EMBER, Pécs, Hungary
W. ENGSTRÖM, Uppsala, Sweden
M. ESKELINEN, Kuopio, Finland
J. A. FERNANDEZ-POL, Chesterfield, MO, USA
S. FERRONE, Pittsburgh, PA, 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
Z. GATALICA, Omaha, NE, USA
D. H. GILDEN, Aurora, CO, USA
G. GITTSCH, Freiburg, Germany
J. S. GREENBERGER, Pittsburgh, PA, USA
J. W. GREINER, Bethesda, MD, USA
D. S. GRIDLEY, Loma Linda, CA, USA
C. J. GRUBBS, Birmingham, AL, USA
F. GUADAGNI, Rome, Italy
F. HALBERG, Minneapolis, MN, USA
R. R. HARDY, Philadelphia, PA, USA
J. HAU, Copenhagen, Denmark
M. HAUER-JENSEN, Little Rock, AR, USA
G. H. HEPPNER, Detroit, MI, USA
K. HIBI, Yokohama, Japan
S. A. IMAM, Pasadena, CA, USA
C. G. IOANNIDES, Houston, TX, USA
J. R. IZBICKI, Hamburg, Germany
- K. S. JEONG, Daegu, S. Korea
I. KISS, Pécs, Hungary
M. KOUTSILIERIS, Athens, Greece
G. R. F. KRUEGER, Köln, Germany
B. KRUSLIN, Zagreb, Croatia
S. A. LAMPRECHT, New York, NY, USA
G. LANDBERG, Lund, Sweden
I. LELONG-REBEL, Illkirch, France
J. LEROY, Strasbourg, France
B. LÉYLAND-JONES, Sioux Falls, SD, USA
W. LICHTENEGGER, Berlin, Germany
P. MADARNAS, Sherbrooke, QC, Canada
H. MAEDA, Kumamoto, Japan
M. MAREEL, Ghent, Belgium
G. MARTORANA, Bologna, Italy
D. P. MIKHAILIDIS, London, UK
J. MOLNÁR, Szeged, Hungary
H. C. MORSE III, Rockville, MD, USA
N. MOTOHASHI, Tokyo, Japan
R. M. NAGLER, Haifa, Israel
R. NARAYANAN, Boca Raton, FL, USA
K. NILSSON, Uppsala, Sweden
K. R. NORUM, Oslo, Norway
R. F. NOVAK, Tampa, FL, USA
K. OGAWA, Tokyo, Japan
M. PAGÉ, Laval, QC, Canada
P. PANTAZIS, Oklahoma City, OK, USA
M.-F. POUPON, Paris, France
F. M. ROBERTSON, Houston, TX, 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
R. M. SNAPKA, Columbus, OH, USA
G.-I. SOMA, Tokushima, Japan
T. A. SPRINGER, Boston, MA, USA
T. TAKAHASHI, Nagoya, Japan
N. TANAKA, Chiba, Japan
K. D. TEW, Charleston, SC, USA
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

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

Editorial Office: journals@iiar-anticancer.org

Managing Editor: editor@iiar-anticancer.org

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

Editorial Office: International Institute of Anticancer Research, 1st km Kapandritiou-Kalamou Rd., Kapandriti, P.O. Box 22, Attiki 19014, Greece. Tel / Fax: +30-22950-53389. 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 comparative physiology and pathology. 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) 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. 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.

Copyright: On publication of a manuscript in IN VIVO, which is a copyrighted publication, the legal ownership of all published parts of the paper passes from the Author(s) to the Journal.

Annual Subscription Rates 2013: Institutional, Euro 855.00 - print or online; Personal, Euro 452.00 - print or online. Prices include rapid delivery and insurance. Previous volumes of IN VIVO (Vol. 1-26, 1987-2012) are available at 50% discount on the above rates.

Subscription Orders: Orders can be placed at agencies, bookstores, or directly with the Publisher. Cheques should be made payable to J.G. Delinasios, Athens, Greece.

Articles in IN VIVO are regularly 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 Palliative 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.

Authorization to photocopy items for internal or personal use, or the internal or personal clients, is granted by IN VIVO, provided that the base fee of \$2.00 per copy, plus 0.40 per page is paid directly to the Copyright Clearance Center, 27 Congress Street, Salem, MA 01970, USA. For those organizations that have been granted a photocopy license by CCC, a separate system of payment has been arranged. The fee code for users of the Transactional Reporting Service is 0258-851 X 2013 \$2.00 + 0.40.

All correspondence (subscription orders, reprint orders, 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

in vivo

**International Journal of Experimental and
Clinical Pathophysiology and Drug Research**

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

**Volume 27
2013**

Editorial Board

- N.J. AGNANTIS, *Department of Pathology, University of Ioannina, Ioannina, Greece*
D. ANDERSON, *Department of Biomedical Sciences, University of Bradford, Bradford, West Yorkshire, UK*
J.P.A. BAAK, *Department of Pathology, Stavanger University Hospital, Stavanger, Norway*
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*
Y. BECKER, *Department of Biochemistry, Faculty of Medicine, Hebrew University of Jerusalem, Jerusalem, Israel*
K. BEIER, *Department of Histology, University of Basel, Basel, Switzerland*
S. BEN-EFRAIM, *Department of Human Microbiology, University of Tel-Aviv, Tel-Aviv, Israel*
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*
B. BODEY, *Department of Pathology, University of Southern California, Reseda, CA, USA*
D.A. BUTTERFIELD, *Department of Biological and Physical Chemistry, University of Kentucky, Lexington, KY, 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, *Northampton, 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*
T. EFFERTH, *Department of Pharmaceutical Biology, Institute of Pharmacy and Biochemistry, University of Mainz, Germany*
I. EMBER, *Department of Public Health, University of Pécs Medical School, Pécs, Hungary*
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*
S. FERRONE, *Department of Immunology, University of Pittsburgh, Pittsburgh, PA, 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*
Z. GATALICA, *Department of Pathology and Creighton Medical Laboratories, Creighton University Medical Center, Omaha, NE, USA*
D.H. GILDEN, *Department of Neurology, University of Colorado Denver School of Medicine, Aurora, CO, 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*

continued

- J.W. GREINER**, *National Cancer Institute, 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*
- F. HALBERG**, *Chronobiology Laboratories, University of Minnesota, Minneapolis, MN, USA*
- R.R. HARDY**, *Fox Chase Cancer Center, Philadelphia, PA, USA*
- 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*
- G.H. HEPPNER**, *Department of Immunology, Michigan Cancer Foundation, Detroit, MI, USA*
- K. HIBI**, *Department of Surgery, Showa University Fujigaoka Hospital, Yokohama, Japan*
- S.A. IMAM**, *Huntington Medical Research Institutes, Gene Therapy Program, Pasadena, CA, USA*
- C.G. IOANNIDES**, *Department of Gynecologic Oncology, The University of Texas M.D. Anderson Cancer Center, Houston, TX, USA*
- J.R. IZBICKI**, *Chirurgische Universitätsklinik, Universitätskrankenhaus Hamburg, Germany*
- K.S. JEONG**, *Department of Pathology, College of Veterinary Medicine, Kyungpook National University, Daegu, S. Korea*
- I. KISS**, *Institute of Preventive Medicine, Medical School, University of Pécs, Pécs, Hungary*
- 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*
- 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*
- B. LÉYLAND-JONES**, *Edith Sanford Breast Cancer Research, Sanford Health, Sioux Falls, SD, USA*
- W. LICHTENEGGER**, *Charité Campus Virchow-Klinikum, Berlin, Germany*
- 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*
- G. MARTORANA**, *Policlinico S. Orsola Malpighi, University of Bologna, Bologna, Italy*
- D.P. MIKHAILIDIS**, *Department of Chemical Pathology, The Royal Free Hospital, London, UK*
- J. MOLNÁR**, *Department of Medical Microbiology and Immunobiology, Faculty of Medicine, University of Szeged, Szeged, Hungary*
- H.C. MORSE III**, *Laboratory of Immunopathology, NIH, Rockville, MD, 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*
- R. NARAYANAN**, *Department of Biological Sciences, Florida Atlantic University, Boca Raton, FL, 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*
- R.F. NOVAK**, *Shriners Hospitals for Children International, Tampa, FL, USA*
- K. OGAWA**, *Department of Surgery, Tokyo Women's Medical University Medical Center East, Tokyo, Japan*
- M. PAGÉ**, *Département de Biologie, Division de Biochimie, Université Laval, Québec, Canada*

- P. PANTAZIS**, *Department of Biochemistry and Molecular Biology, University of Oklahoma Health Sciences Center, Oklahoma City, OK, USA*
- M.-F. POUPON**, *Institut Curie, Section de Recherche, Paris, France*
- F.M. ROBERTSON**, *Department of Experimental Therapeutics, The University of Texas M.D. Anderson Cancer Center, Houston, TX, USA*
- 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*
- R.M. SNAPKA**, *Department of Radiology, The Ohio State University, Columbus, OH, USA*
- G.-I. SOMA**, *Institutes for Health Sciences, Tokushima Bunri University, Tokushima, Japan*
- T.A. SPRINGER**, *Department of Pathology, Harvard Medical School, Boston, MA, USA*
- T. TAKAHASHI**, *Aichi Cancer Center, Nagoya, Japan*
- N. TANAKA**, *Department of Animal Pharmaceutical Science, Chiba Institute of Science, Chiba, Japan*
- K.D. TEW**, *Department of Pharmacology, Medical University of South Carolina, Charleston, SC, USA*
- 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*

Instructions to Authors 2013

General Policy. IN VIVO is a multidisciplinary journal designed to bring together original high quality works and reviews on experimental and clinical biomedical research. The principal aim of IN VIVO is to provide for the prompt (print and online) publication of 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 review, when appropriate, by two members of the Editorial Board. The Editors reserve the right to improve manuscripts on grammar and style.

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

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

NIH Open Access Policy. The journal acknowledges that authors of NIH funded research retain the right to provide a copy of the final manuscript to the NIH four months after publication in IN VIVO, for public archiving in PubMed Central.

Copyright. Once a manuscript has been published in IN VIVO, which is a copyrighted publication, the legal ownership of all published parts of the paper has passed from the Author(s) to the journal. Material published in the journal may not be reproduced or published elsewhere without written consent of the Managing Editor or 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. Reasonable economy should be exercised with respect to the number of tables and illustrations used. Papers should be written in clear, concise English. Spelling should follow that given in the "Shorter Oxford English Dictionary".

Manuscripts. Submitted manuscripts should not exceed fourteen (14) pages (approximately 250 words per double - spaced typed page), including abstract, text, tables, figures, and references (corresponding to 4 printed pages). Papers exceeding four printed pages will be subject to excess page charges. All 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 (whether photographs or graphs) should be clear, high contrast, at the size they are to appear in the journal: 8.00 cm (3.15 in.) wide for a single column; 17.00 cm (6.70 in.) for a double column; maximum height: 20.00 cm (7.87 in.). Graphs must be submitted as photographs 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. Colour plates are charged.

Tables. Each table should be submitted on a separate page, typed double-spaced. Tables should be numbered with Roman numerals and should include a short title.

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.

References. Authors must assume responsibility for the accuracy 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.

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 to Authors regarding the format of your manuscript and references. There are 3 ways to submit your article (NOTE: Please use only one of the 3 options. Do not send your article twice.):

1. To submit your article online please visit: IIAR-Submissions (link to: <http://www.iiar-anticancer.org/submissions/login.php>)
2. You can send your article via e-mail to journals@iiar-anticancer.org (mail to: journals@iiar-anticancer.org). Please remember to always indicate the name of the journal you wish to submit your paper. The text should be sent as a Word document (*.doc) attachment. Tables, figures and cover letter can also be sent as e-mail attachments.
3. You can send the manuscript of your article via regular mail in a USB stick, DVD, CD or floppy disk (including text, tables and figures) together with three hard copies to the following address:

John G. Delinasios, International Institute of Anticancer Research (IIAR), Editorial Office of ANTICANCER RESEARCH, IN VIVO and CANCER GENOMICS & PROTEOMICS, 1st km Kapandritiou-Kalamou Road, P.O. Box 22, GR-19014 Kapandriti, Attiki, GREECE.

Submitted articles will not be returned to Authors upon rejection.

Galley Proofs. Unless otherwise indicated, galley proofs will be sent to the first-named Author of the submission. Corrections of galley proofs should be limited to typographical errors. Reprints, PDF files, and/or Open Access may be ordered after the acceptance of the paper. Requests should be addressed to the Editorial Office.

Copyright© 2013 International Institute of Anticancer Research (J.G. 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 transmitter in any form or by any means, electronic, mechanical, photocopying, microfilming, recording or otherwise, without written permission from the Publisher.

Reviews