

# ANTICANCER RESEARCH

## International Journal of Cancer Research and Treatment

ISSN: 0250-7005

Volume 36, Number 5, May 2016

### Contents

#### Reviews

- PARP Inhibitors in Epithelial Ovarian Cancer: State of Art and Perspectives of Clinical Research. A. GADDUCCI, M.E. GUERRIERI (*Pisa, Italy*) ..... 2055
- Methods to Increase Future Liver Remnant Volume in Patients with Primarily Unresectable Colorectal Liver Metastases: Current State and Future Perspectives. V. TRESKA (*Pilsen, Czech Republic*) ..... 2065
- The NF $\kappa$ B Signaling Pathway in Papillomavirus-induced Lesions: Friend or Foe? R.M. GIL DA COSTA, M.M.S.M. BASTOS, R. MEDEIROS, P.A. OLIVEIRA (*Porto; Vila Real, Portugal*) ..... 2073
- Sphingosine Kinase Inhibitors as Maintenance Therapy of Glioblastoma After Ceramide-Induced Response. L.A. SORDILLO, P.P. SORDILLO, L. HELSON (*Quakertown, PA, USA*) ..... 2085

#### Experimental Studies

- Unique Boron Carbide Nanoparticle Nanobio Interface: Effects on Protein-RNA Interactions and 3-D Spheroid Metastatic Phenotype. R.K. DELONG, M.N. HURST, S. ARYAL, N.K. INCHUN (*Manhattan, KS; Shreveport, LA, USA*) ..... 2097
- A Novel 1,2-Dihydroquinoline Anticancer Agent and Its Delivery to Tumor Cells Using Cationic Liposomes. X. MA, Y. WU, X. YANG, S. YANG, Y. LI, Y. HUANG, R.J. LEE, T. BAI, Y. LUO (*Changchun, Jilin, PR China; Columbus, OH; Gainesville, FL, USA*) ..... 2105
- Imaging Nuclear–Cytoplasmic Dynamics in Primary and Metastatic Colon Cancer in Nude Mice. K. HASEGAWA, A. SUETSUGU, M. NAKAMURA, T. MATSUMOTO, H. AOKI, T. KUNISADA, M. BOUVET, M. SHIMIZU, R.M. HOFFMAN (*Gifu, Japan; San Diego, CA, USA*) ..... 2113

Contents continued on the back cover

# ANTICANCER RESEARCH

International Journal of Cancer Research and Treatment



ISSN (print): 0250-7005  
ISSN (online): 1791-7530

## Editorial Board

- P. A. ABRAHAMSSON**, Malmö, Sweden  
**B. B. AGGARWAL**, Houston, TX, USA  
**T. AKIMOTO**, Kashiwa, Chiba, Japan  
**P. Z. ANASTASIADIS**, Jacksonville, FL, USA  
**A. ARGIRIS**, San Antonio, TX, USA  
**J. P. ARMAND**, Toulouse, France  
**V. I. AVRAMIS**, Los Angeles, CA, USA  
**R. C. BAST**, Houston, TX, USA  
**D.-T. BAU**, Taichung, Taiwan, ROC  
**G. BAUER**, Freiburg, Germany  
**E. E. BAULIEU**, Le Kremlin-Bicetre, France  
**E. J. BENZ, Jr.**, Boston, MA, USA  
**J. BERGH**, Stockholm, Sweden  
**F. T. BOSMAN**, Lausanne, Switzerland  
**G. BROICH**, Monza, Italy  
**Ø. S. BRULAND**, Oslo, Norway  
**J. M. BUATTI**, Iowa City, IA, USA  
**M. M. BURGER**, Basel, Switzerland  
**M. CARBONE**, Honolulu, HI, USA  
**C. CARLBERG**, Kuopio, Finland  
**J. CARLSSON**, Uppsala, Sweden  
**A. F. CHAMBERS**, London, ON, Canada  
**P. CHANDRA**, Frankfurt am Main, Germany  
**L. CHENG**, Indianapolis, IN, USA  
**J.-G. CHUNG**, Taichung, Taiwan, ROC  
**E. DE CLERCQ**, Leuven, Belgium  
**W. DEN OTTER**, Amsterdam, The Netherlands  
**E. P. DIAMANDIS**, Toronto, ON, Canada  
**G. TH. DIAMANDOPOULOS**, Boston, MA, USA  
**D. W. FELSHER**, Stanford, CA, USA  
**J. A. FERNANDEZ-POL**, Chesterfield, MO, USA  
**I. J. FIDLER**, Houston, TX, USA  
**A. P. FIELDS**, Jacksonville, FL, USA  
**B. FUCHS**, Zurich, Switzerland  
**D. FUCHS**, Innsbruck, Austria  
**G. GABBIANI**, Geneva, Switzerland  
**R. GANAPATHI**, Charlotte, NC, USA  
**A. F. GAZDAR**, Dallas, TX, USA  
**J. H. GESCHWIND**, Baltimore, MD, USA  
**A. GIORDANO**, Philadelphia, PA, USA  
**G. GITSCH**, Freiburg, Germany  
**R. H. GOLDFARB**, Guilford, CT, USA  
**L. HELSON**, Quakertown, PA, USA  
**R. M. HOFFMAN**, San Diego, CA, USA  
**S. C. JHANWAR**, New York, NY, USA  
**J. V. JOHANNESSEN**, Oslo, Norway  
**B. KAINA**, Mainz, Germany  
**P. -L. KELLOKUMPU-LEHTINEN**, Tampere, Finland  
**D. G. KIEBACK**, Schleswig, Germany  
**R. KLAPDOR**, Hamburg, Germany  
**S. D. KOTTARIDIS**, Athens, Greece  
**G. R. F. KRUEGER**, Köln, Germany  
**Pat M. KUMAR**, Manchester, UK  
**Shant KUMAR**, Manchester, UK  
**O. D. LAERUM**, Bergen, Norway  
**F. J. LEJEUNE**, Lausanne, Switzerland  
**L. F. LIU**, Piscataway, NJ, USA  
**D. M. LOPEZ**, Miami, FL, USA  
**E. LUNDGREN**, Umeå, Sweden  
**Y. MAEHARA**, Fukuoka, Japan  
**J. MAHER**, London, UK  
**J. MARESCAUX**, Strasbourg, France  
**J. MARK**, Skövde, Sweden  
**S. S. MARTIN**, Baltimore, MD, USA  
**S. MITRA**, Houston, TX, USA  
**S. MIYAMOTO**, Fukuoka, Japan  
**M. MUELLER**, Villingen-Schwenningen, Germany  
**F. M. MUGGIA**, New York, NY, USA  
**M. NAMIKI**, Kanazawa, Ishikawa, Japan  
**R. NARAYANAN**, Boca Raton, FL, USA  
**K. NILSSON**, Uppsala, Sweden  
**S. PATHAK**, Houston, TX, USA  
**J.L. PERSSON**, Malmö, Sweden  
**G. J. PILKINGTON**, Portsmouth, UK  
**C. D. PLATSOUKAS**, Norfolk, VA, USA  
**A. POLLIACK**, Jerusalem, Israel  
**M. RIGAUD**, Limoges, France  
**U. RINGBORG**, Stockholm, Sweden  
**M. ROSELLI**, Rome, Italy  
**A. SCHAUER**, Göttingen, Germany  
**M. SCHNEIDER**, Wuppertal, Germany  
**A. SETH**, Toronto, ON, Canada  
**G. V. SHERBET**, Newcastle-upon-Tyne, UK  
**G.-I. SOMA**, Kagawa, Japan  
**G. S. STEIN**, Burlington, VT, USA  
**T. STIGBRAND**, Umeå, Sweden  
**T. M. THEOPHANIDES**, Athens, Greece  
**P. M. UELAND**, Bergen, Norway  
**H. VAN VLIERBERGHE**, Ghent, Belgium  
**R. G. VILE**, Rochester, MN, USA  
**M. WELLER**, Zurich, Switzerland  
**B. WESTERMARK**, Uppsala, Sweden  
**Y. YEN**, Duarte, CA, USA  
**M.R.I. YOUNG**, Charleston, SC, USA  
**B. ZUMOFF**, New York, NY, USA  
**J. G. DELINASIOS**, Athens, Greece  
Managing Editor  
**G. J. DELINASIOS**, Athens, Greece  
Assistant Managing Editor and  
Executive Publisher  
**E. ILIADIS**, Athens, Greece  
Production Editor

**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.

**U.S. Branch:** Anticancer Research USA, Inc., 111 Bay Avenue, Highlands, NJ 07732, USA.

E-mails: Editorial Office: journals@iia-anticancer.org

Managing Editor: editor@iia-anticancer.org

ANTICANCER RESEARCH supports: (a) the establishment and the activities of the INTERNATIONAL INSTITUTE OF ANTICANCER RESEARCH (IIAR; Kapandriti, Attiki, Greece); and (b) the organization of the International Conferences of Anticancer Research. The IIAR is a member of UICC. For more information about ANTICANCER RESEARCH, IIAR and the Conferences, please visit the IIAR website: [www.iia-anticancer.org](http://www.iia-anticancer.org)

**Publication Data:** ANTICANCER RESEARCH (AR) is published monthly from January 2009. Each annual volume comprises 12 issues. Annual Author and Subject Indices are included in the last issue of each volume. ANTICANCER RESEARCH Vol. 24 (2004) and onwards appears online with Stanford University HighWire Press from April 2009.

**Copyright:** On publication of a manuscript in AR, 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 2016 per volume:** Institutional subscription US\$ 1,898.00 (online) or US\$ 2,277.00 (print & online). Personal subscription US\$ 897.00 (online) or US\$ 1,277.00 (print & online). Prices include rapid delivery and insurance. The complete previous volumes of Anticancer Research (Vol. 1-35, 1981-2015) are available at 50% discount on the above rates.

**Subscription Orders:** Orders can be placed at agencies, bookstores, or directly with the Publisher. (e-mail: [subscriptions@iia-anticancer.org](mailto:subscriptions@iia-anticancer.org))

**Advertising:** All correspondence and rate requests should be addressed to the Editorial Office.

**Book Reviews:** Recently published books and journals should be sent to the Editorial Office. Reviews will be published within 2-4 months.

Articles in ANTICANCER RESEARCH are regularly indexed in all bibliographic services, including Current Contents (Life Sciences), Science Citation Index, Index Medicus, Biological Abstracts, PubMed, Chemical Abstracts, Excerpta Medica, University of Sheffield Biomedical Information Service, Current Clinical Cancer, AIDS Abstracts, Elsevier Bibliographic Database, EMBASE, Compendex, GEOBASE, EMBiology, Elsevier BIOBASE, FLUIDEX, World Textiles, Scopus, Progress in Palliative Care, Cambridge Scientific Abstracts, Cancergram (International Cancer Research Data Bank), MEDLINE, Reference Update - RIS Inc., PASCAL-CNRS, Inpharma-Reactions (Datastar, BRS), CABS, Immunology Abstracts, Telegen Abstracts, Genetics Abstracts, Nutrition Research Newsletter, Dairy Science Abstracts, Current Titles in Dentistry, Inpharma Weekly, BioBase, MedBase, CAB Abstracts/Global Health Databases, Investigational Drugs Database, VINITI Abstracts Journal, Leeds Medical Information, PubsHub, Sociedad Iberoamericana de Información Científica (SIIC) Data Bases.

Authorization to photocopy items for internal or personal use, or the internal or personal clients, is granted by ANTICANCER RESEARCH, 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 0250-7005/2016 \$2.00 +0.40.

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

Copyright© 2016, International Institute of Anticancer Research (Dr. John G. Delinasios), All rights reserved.

D.T.P. BY IIAR

PRINTED BY ENTYPPO, ATHENS, GREECE. PRINTED ON ACID-FREE PAPER

*Announcement - Call for Papers*

**Special Issue of ANTICANCER RESEARCH 2016  
on *NEW ANTICANCER AGENTS***

TOPICS:

A. Experimental Studies on “New Anticancer Agents”

1. Synthesis and evaluation *in vitro* and *in vivo*
2. Mechanism of action
3. Reversal of resistance to anticancer agents

B. Clinical Studies on “New Anticancer Agents”

1. Pharmacology
2. Phase I and II Studies
3. Combination chemotherapy
4. Immunotherapeutic agents
5. New methodologies in drug delivery and therapy

Deadline for submission of articles: **August 22, 2016**

Publication date: November 2016

Information:

Dr. George J. Delinasios, e-mail: [journals@iiar-anticancer.org](mailto:journals@iiar-anticancer.org)

# CANCER GENOMICS & PROTEOMICS

www.cgp.iarjournals.org

Print ISSN (2004-2012): 1109-6535

Online ISSN: 1790-6245

VOL. 1 (2004) - VOL. 9 (2012) (print and online)  
From VOL. 10 (2013) online – only and open access



International Online **Open Access** Journal

**General Policy.** CANCER GENOMICS & PROTEOMICS (CGP) welcomes submissions of original high quality articles and reviews on all aspects of the application of genomic and proteomic technologies to experimental and clinical cancer research. The journal's scientific spectrum includes: (a) molecular causes of carcinogenesis, cancer progression and metastasis; (b) structural and functional aspects of genes in the cancer cell; (c) advances in genomic and proteomic technologies applicable to cancer research; (d) anticancer drug design and drug development.

A main aim of CGP is to ensure the prompt and confidential review, and rapid publication of original works and reviews, generally within 1-3 months from submission or 1-2 months from acceptance.

CGP is published bimonthly by the **International Institute of Anticancer Research (IIAR)** and is available online with **Stanford University HighWire Press**. The IIAR is a member of UICC. For more information please visit our website [www.cgp.iarjournals.org](http://www.cgp.iarjournals.org).

**Editorial Office:** International Institute of Anticancer Research, 1st km Kapandritiou-Kalamou Rd., P.O. Box 22, Kapandriti, Attiki 19014, Greece. Tel: +30 22950 52945, Fax: +30 22950 53389.

U.S. Branch: Anticancer Research Inc., USA, 111 Bay Avenue, Highlands, NJ, USA.

E-mail: [journals@iiar-anticancer.org](mailto:journals@iiar-anticancer.org); IIAR websites: [www.iiar-anticancer.org](http://www.iiar-anticancer.org) and [www.iarjournals.org](http://www.iarjournals.org)

## A Selection of Recent Articles

Identification of Novel Biomarker and Therapeutic Target Candidates for Diagnosis and Treatment of Follicular Adenoma. X. LAI, S. CHEN (*Indianapolis, IN, USA*)

A Low-density Antigen Array for Detection of Disease-associated Autoantibodies in Human Plasma. R.I. SOMIARI, R. SUTPHEN, K. RENGANATHAN, S. RUSSELL, E. PASTWA, S.A. SOMIARI (*Johnstown; Windber, PA; Tampa, FL, USA*)

WNT/ $\beta$ -catenin Signaling Pathway and Downstream Modulators in Low- and High-grade Glioma. T. DENYSENKO, L. ANNOVAZZI, P. CASSONI, A. MELCARNE, M. MELLAI, D. SCHIFFER (*Vercelli; Turin, Italy*)

Identification of Endogenous Controls for Use in miRNA Quantification in Human Cancer Cell Lines. M.K. DAS, R. ANDREASSEN, T.B. HAUGEN, K. FURU (*Oslo, Norway*)

Expression of Genes with Copy Number Alterations and Survival of Patients with Pancreatic Adenocarcinoma. D.J. BIRNBAUM, F. BERTUCCI, P. FINETTI, J. ADELAÏDE, M. GIOVANNINI, O. TURRINI, J.R. DELPERO, J.L. RAOUL, M. CHAFFANET, V. MOUTARDIER, D. BIRNBAUM, E. MAMESSIER (*Marseille, France*)

Doxorubicin Affects Expression of Proteins of Neuronal Pathways in MCF-7 Breast Cancer Cells. M. PETROVIC, C. SIMILLION, P. KRUZLIAK, J. SABO, M. HELLER (*Kosice, Slovak Republic; Bern, Switzerland; Brno, Czech Republic*)

Molecular Mechanisms of Bone Metastasis. U.H. WEIDLE, F. BIRZELE, G. KOLLMORGEN, R. RÜGER (*Penzberg, Germany*)

Identification of Prognostically Relevant Chromosomal Abnormalities in Routine Diagnostics of Multiple Myeloma Using Genomic Profiling. E. KJELDEN (*Aarhus, Denmark*)

MTA1 Is Up-regulated in Colorectal Cancer and Is Inversely Correlated with Lymphatic Metastasis. J. LI, L. YE, P.-H. SUN, L. SATHERLEY, R. HARGEST, Z. ZHANG, W.G. JIANG (*Cardiff, UK; Beijing, PR China*)

Ensuring Sample Quality for Biomarker Discovery Studies – Use of ICT Tools to Trace Biosample Life-cycle. S. RIONDINO, P. FERRONI, A. SPILA, J. ALESSANDRONI, R. D'ALESSANDRO, V. FORMICA, D. DELLA-MORTE, R. PALMIROTTA, U. NANNI, M. ROSELLI, F. GUADAGNI (*Rome, Italy*)

Significant Association of Caveolin-1 and Caveolin-2 with Prostate Cancer Progression. S. SUGIE, S. MUKAI, K. YAMASAKI, T. KAMIBEPPU, H. TSUKINO, T. KAMOTO (*Miyazaki, Japan*)

Delayed 5-Fluorouracil Toxicity with Uridine Triacetate in Patients with Dihydropyrimidine Dehydrogenase Deficiency. M.W. SAIF, R.B. DIASIO (*Boston, MA; Rochester, MN, USA*)

## Reviews