

ANTICANCER RESEARCH

International Journal of Cancer Research and Treatment

ISSN: 0250-7005

Volume 37, Number 5, May 2017

Contents

Reviews

- The Kynurenine Pathway: A Primary Resistance Mechanism in Patients with Glioblastoma. P.P. SORDILLO, L.A. SORDILLO, L. HELSON (*Quakertown, PA; New York, NY, USA*) 2159
- Implications of Different Cancer Stem Cell Phenotypes in Breast Cancer. A.D.C. PAULA, C. LOPES (*Porto, Portugal*) 2173
- Updates and Critical Evaluation on Novel Biomarkers for the Malignant Progression of Intraductal Papillary Mucinous Neoplasms of the Pancreas. D. MORIS, C. DAMASKOS, E. SPARTALIS, A. PAPALAMPROS, S. VERNADAKIS, D. DIMITROULIS, J. GRINIATSOS, E. FELEKOURAS, N. NIKITEAS (*Columbus, OH, USA; Athens, Greece; Riyadh, Kingdom of Saudi Arabia*) 2185

Experimental Studies

- Delayed Progression of Lung Metastases Following Delivery of a Prodrug-activating Enzyme. L. DORE-SAVARD, Z. CHEN, P.T. WINNARD JR., B. KRISHNAMACHARY, V. RAMAN, M.E. BLACK, Z.M. BHUJWALLA (*Baltimore, MD; Pullman, WA, USA*) 2195
- Spheroid-based 3D Cell Cultures Enable Personalized Therapy Testing and Drug Discovery in Head and Neck Cancer. J. HAGEMANN, C. JACOBI, M. HAHN, V. SCHMID, C. WELZ, S. SCHWENK-ZIEGER, R. STAUBER, P. BAUMEISTER, S. BECKER (*Mainz; Munich; Göttingen, Germany*) 2201
- Moesin Expression is Associated with Glioblastoma Cell Proliferation and Invasion. Q. WANG, X. LU, S. ZHAO, M. PANG, X. WU, H. WU, R.M. HOFFMAN, Z. YANG, Y. ZHANG (*Wuxi; Nanjing, PR China; San Diego, CA, USA*) 2211

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
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
M. BOUVET, La Jolla, CA, USA
J. BOYD, Miami, FL, USA
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
R. CLARKE, Washington, DC, USA
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. FELSER, Stanford, CA, USA
J. A. FERNANDEZ-POL, Chesterfield, MO, USA
I. J. FIDLER, Houston, TX, USA
A. P. FIELDS, Jacksonville, FL, USA
H. FU, Atlanta, GA, 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. HENRIKSSON, Umeå, Sweden
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
S. LINDER, Linköping, Sweden
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
S. MONCADA, Manchester, UK
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. PLATSOUCAS, Norfolk, VA, USA
A. POLLIACK, Jerusalem, Israel
M. RIGAUD, Limoges, France
U. RINGBORG, Stockholm, Sweden
M. ROSELLI, Rome, Italy
S.T. ROSEN, Duarte, CA, USA
A. SCHAUER, Göttingen, Germany
M. SCHNEIDER, Wuppertal, Germany
J. SEHOULLI, Berlin, Germany
A. SETH, Toronto, ON, Canada
G. V. SHERBET, Newcastle-upon-Tyne, UK
A. SLOMINSKI, Birmingham, AL, USA
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
J. WESTERMARCK, Turku, Finland
B. WESTERMARCK, Uppsala, Sweden
Y. YEN, Duarte, CA, USA
M.R.I. YOUNG, Charleston, SC, USA
B. ZUMOFF, New York, NY, USA
G. J. DELINASIOS, Athens, Greece
Managing Editor and
Executive Publisher
J. G. DELINASIOS, Athens, Greece
Managing Editor (1981-2016)

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

Publication Data: ANTICANCER RESEARCH (AR) is published bimonthly from January 1981 to December 2008 and 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 2017 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. 1-36, 1981-2016) 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)

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.

Obtaining permission to reuse or reproduce our content: AR has partnered with Copyright Clearance Center (CCC) to make it easy to secure permissions to reuse its content. Please visit www.copyright.com and enter the title that you are requesting permission for in the 'Get Permission' search box. For assistance in placing a permission request, Copyright Clearance Center can be contacted directly at: Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923 USA. Phone: +1-978-750-8400. Fax: +1-978-646-8600. E-mail: info@copyright.com.

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

D.T.P. BY IIAR

PRINTED BY ENTYP0, ATHENS, GREECE. PRINTED ON ACID-FREE PAPER

Announcement - Call for Papers

**Special Issue of ANTICANCER RESEARCH 2017
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 21, 2017**

Publication date: November 2017

Information:

Dr. George J. Delinasios, e-mail: journals@iiar-anticancer.org

Announcement - Call for Papers

**Special Issue of CANCER GENOMICS & PROTEOMICS
on *FOODOMICS***

TOPICS:

- Carcinogenic substances in food
- Cancer-preventive agents in food and beverages
- Nutrition and cancer treatment
- Nutrition and cancer prevention
- Foodomics and genome-wide transcriptomics and metabolomics analyses in cancer cells and tissues
- Novel Foodomics approaches for functional analysis in cancer

Deadline for submission of articles: **August 15, 2017**

Publication date: November 2017

Information:

Dr. George J. Delinasios, e-mail: journals@iiar-anticancer.org

Reviews