



Review

Designing a broad-spectrum integrative approach for cancer prevention and treatment



Keith I. Block^{a,*}, Charlotte Gyllenhaal^a, Leroy Lowe^{b,er,**}, Amedeo Amedei^c, A.R.M. Ruhul Amin^d, Amr Amin^e, Katia Aquilano^f, Jack Arbiser^{d,ep,eq}, Alexandra Arreola^g, Alla Arzumanyan^h, S. Salman Ashrafⁱ, Asfar S. Azmi^j, Fabian Benencia^k, Dipita Bhakta^l, Alan Bilslan^m, Anupam Bishayeeⁿ, Stacy W. Blain^o, Penny B. Block^a, Chandra S. Boosani^p, Thomas E. Carey^q, Amancio Carnero^r, Marianeve Carotenuto^{s,t}, Stephanie C. Casey^u, Mrinmay Chakrabarti^v, Rupesh Chaturvedi^w, Georgia Zhuo Chen^d, Helen Chen^x, Sophie Chen^y, Yi Charlie Chen^z, Beom K. Choi^{aa}, Maria Rosa Ciriolo^f, Helen M. Coley^{ab}, Andrew R. Collins^{ac}, Marisa Connell^x, Sarah Crawford^{ad}, Colleen S. Curran^{ae}, Charlotta Dabrosin^{af}, Giovanna Damia^{ag}, Santanu Dasgupta^{ah}, Ralph J. DeBerardinis^{aj}, William K. Decker^{ak}, Punita Dhawan^{al}, Anna Mae E. Diehl^{am}, Jin-Tang Dong^d, Q. Ping Dou^j, Janice E. Drew^{an}, Eyad Elkord^{ao}, Bassel El-Rayes^{ap}, Mark A. Feitelson^h, Dean W. Felsher^u, Lynnette R. Ferguson^{aq}, Carmela Fimognari^{ar}, Gary L. Firestone^{as}, Christian Frezza^{at}, Hiromasa Fujii^{au}, Mark M. Fuster^{av}, Daniele Generali^{aw,ax}, Alexandros G. Georgakilas^{ay}, Frank Gieseler^{az}, Michael Gilbertson^{ba}, Michelle F. Green^{bb}, Brendan Grue^{bc}, Gunjan Guha^l, Dorota Halicka^{bd}, William G. Helferich^{be}, Petr Heneberg^{bf}, Patricia Hentosh^{bg}, Matthew D. Hirschey^{am,bb}, Lorne J. Hofseth^{bh}, Randall F. Holcombe^{bi}, Kanya Honoki^{au}, Hsue-Yin Hsu^{bj}, Gloria S. Huang^{bk}, Lasse D. Jensen^{bl,bm}, Wen G. Jiang^{bn}, Lee W. Jones^{bo}, Phillip A. Karpowicz^{bp}, W. Nicol Keith^m, Sid P. Kerkar^{bq}, Gazala N. Khan^{br}, Mahin Khatami^{bs}, Young H. Ko^{bt}, Omer Kucuk^d, Rob J. Kulathinal^h, Nagi B. Kumar^{bu}, Byoung S. Kwon^{aa,bw}, Anne Le^{bx}, Michael A. Lea^{by}, Ho-Young Lee^{bz}, Terry Lichtor^{ca}, Liang-Tzung Lin^{cb}, Jason W. Locasale^{cc}, Bal L. Lokeshwar^{cd}, Valter D. Longo^{ce}, Costas A. Lyssiotis^{cf}, Karen L. MacKenzie^{cg}, Meenakshi Malhotra^{ch}, Maria Marino^{ci}, Maria L. Martinez-Chantar^{cj}, Ander Matheu^{ck}, Christopher Maxwell^x, Eoin McDonnell^{bb}, Alan K. Meeker^{cl}, Mahya Mehrmohamadi^{cm}, Kapil Mehta^{cn}, Gregory A. Michelotti^{am}, Ramzi M. Mohammad^j, Sulma I. Mohammed^{co}, D. James Morre^{cp}, Irfana Muqbil^j, Vinayak Muralidhar^{cq,cr}, Michael P. Murphy^{cs}, Ganji Purnachandra Nagaraju^{ap}, Rita Nahta^d, Elena Niccolai^{ct}, Somaira Newsheen^{cu}, Carolina Panis^{cv}, Francesco Pantano^{cw}, Virginia R. Parslow^{aq}, Graham Pawelec^{cx}, Peter L. Pedersen^{cy}, Brad Poore^{bx}, Deepak Poudyal^{bh}, Satya Prakash^{ch}, Mark Prince^{cz}, Lizzia Raffaghello^{da}, Jeffrey C. Rathmell^{bb}, W. Kimryn Rathmell^g, Swapan K. Ray^v, Jörg Reichrath^{db}, Sarallah Rezazadeh^{dc}, Domenico Ribatti^{dd}, Luigi Ricciardiello^{de}, R. Brooks Robey^{df,dg}, Francis Rodier^{dh,di}, H.P. Vasantha Rupasinghe^{dj}, Gian Luigi Russo^{dk},

* Corresponding author at: Block Center for Integrative Cancer Treatment, 5230 Old Orchard Road, Skokie, IL 60077, United States.

** Corresponding author at: Getting to Know Cancer, Room 229A, 36 Arthur Street, Truro, Nova Scotia, Canada.

E-mail addresses: drblock@blockmedical.com (K.I. Block), Leroy.lowe@gettingtoknowcancer.org (L. Lowe).

Elizabeth P. Ryan^{dl}, Abbas K. Samadi^{dm}, Isidro Sanchez-Garcia^{dn}, Andrew J. Sanders^{bn}, Daniele Santini^{cw}, Malancha Sarkar^{do}, Tetsuro Sasada^{dp}, Neeraj K. Saxena^{dq}, Rodney E. Shackelford^{dr}, H.M.C. Shantha Kumara^{bv}, Dipali Sharma^{ds}, Dong M. Shin^d, David Sidransky^{dt}, Markus David Siegelin^{du}, Emanuela Signori^{dv}, Neetu Singh^{dw}, Sharanya Sivanand^{dx}, Daniel Sliva^{dy}, Carl Smythe^{dz}, Carmela Spagnuolo^{dk}, Diana M. Stafforini^{ea}, John Stagg^{eb}, Pochi R. Subbarayan^{ec}, Tabetha Sundin^{ed}, Wamidh H. Talib^{ee}, Sarah K. Thompson^{ef}, Phuoc T. Tran^{eg}, Hendrik Ungefroren^{az}, Matthew G. Vander Heiden^{cr}, Vasundara Venkateswaran^{eh}, Dass S. Vinay^{ai}, Panagiotis J. Vlachostergios^{ei}, Zongwei Wang^{ej}, Kathryn E. Wellen^{dx}, Richard L. Whelan^{bv}, Eddy S. Yang^{ek}, Huanjie Yang^{el}, Xujuan Yang^{be}, Paul Yaswen^{em}, Clement Yedjou^{en}, Xin Yin^{av}, Jiyue Zhu^{eo}, Massimo Zollo^{s,t}

^a Block Center for Integrative Cancer Treatment, Skokie, IL, United States

^b Getting to Know Cancer, Truro, Nova Scotia, Canada

^c Department of Experimental and Clinical Medicine, University of Florence, Florence, Italy

^d Winship Cancer Institute of Emory University, Atlanta, GA, United States

^e Department of Biology, College of Science, United Arab Emirates University, Al Ain, United Arab Emirates

^f Department of Biology, University of Rome "Tor Vergata", Rome, Italy

^g Lineberger Comprehensive Cancer Center, University of North Carolina, Chapel Hill, NC, United States

^h Department of Biology, Temple University, Philadelphia, PA, United States

ⁱ Department of Chemistry, College of Science, United Arab Emirates University, Al Ain, United Arab Emirates

^j Department of Oncology, Karmanos Cancer Institute, Wayne State University, Detroit, MI, United States

^k Department of Biomedical Sciences, Ohio University, Athens, OH, United States

^l School of Chemical and Bio Technology, SASTRA University, Thanjavur, Tamil Nadu, India

^m University of Glasgow, Glasgow, United Kingdom

ⁿ Department of Pharmaceutical Sciences, College of Pharmacy, Larkin Health Sciences Institute, Miami, FL, United States

^o Department of Pediatrics, State University of New York, Downstate Medical Center, Brooklyn, NY, United States

^p Department of BioMedical Sciences, School of Medicine, Creighton University, Omaha, NE, United States

^q Head and Neck Cancer Biology Laboratory, University of Michigan, Ann Arbor, MI, United States

^r Instituto de Biomedicina de Sevilla, Consejo Superior de Investigaciones Científicas, Seville, Spain

^s Centro di Ingegneria Genetica e Biotecnologia Avanzate, Naples, Italy

^t Department of Molecular Medicine and Medical Biotechnology, Federico II, Via Pansini 5, 80131 Naples, Italy

^u Stanford University, Division of Oncology, Department of Medicine and Pathology, Stanford, CA, United States

^v Department of Pathology, Microbiology, and Immunology, University of South Carolina, School of Medicine, Columbia, SC, United States

^w School of Biotechnology, Jawaharlal Nehru University, New Delhi, India

^x Department of Pediatrics, University of British Columbia, Michael Cuccione Childhood Cancer Research Program, Child and Family Research Institute, Vancouver, British Columbia, Canada

^y Ovarian and Prostate Cancer Research Laboratory, Guildford, Surrey, United Kingdom

^z Department of Biology, Alderson Broaddus University, Philippi, WV, United States

^{aa} Cancer Immunology Branch, Division of Cancer Biology, National Cancer Center, Goyang, Gyeonggi, Republic of Korea

^{ab} Faculty of Health and Medical Sciences, University of Surrey, Guildford, Surrey, United Kingdom

^{ac} Department of Nutrition, Faculty of Medicine, University of Oslo, Oslo, Norway

^{ad} Cancer Biology Research Laboratory, Southern Connecticut State University, New Haven, CT, United States

^{ae} School of Medicine and Public Health, University of Wisconsin-Madison, Madison, WI, United States

^{af} Department of Oncology and Department of Clinical and Experimental Medicine, Linköping University, Linköping, Sweden

^{ag} Department of Oncology, Istituto Di Ricovero e Cura a Carattere Scientifico – Istituto di Ricerche Farmacologiche Mario Negri, Milan, Italy

^{ah} Department of Cellular and Molecular Biology, the University of Texas Health Science Center at Tyler, Tyler, TX, United States

^{ai} Section of Clinical Immunology, Allergy, and Rheumatology, Department of Medicine, Tulane University Health Sciences Center, New Orleans, LA, United States

^{aj} Children's Medical Center Research Institute, University of Texas – Southwestern Medical Center, Dallas, TX, United States

^{ak} Department of Pathology & Immunology, Baylor College of Medicine, Houston, TX, United States

^{al} Department of Surgery and Cancer Biology, Division of Surgical Oncology, Vanderbilt University School of Medicine, Nashville, TN, United States

^{am} Department of Medicine, Duke University Medical Center, Durham, NC, United States

^{an} Rowett Institute of Nutrition and Health, University of Aberdeen, Aberdeen, Scotland, United Kingdom

^{ao} College of Medicine & Health Sciences, United Arab Emirates University, Al Ain, United Arab Emirates

^{ap} Department of Hematology and Medical Oncology, Emory University, Atlanta, GA, United States

^{aq} Discipline of Nutrition and Auckland Cancer Society Research Centre, University of Auckland, Auckland, New Zealand

^{ar} Dipartimento di Scienze per la Qualità della Vita Alma Mater Studiorum-Università di Bologna, Rimini, Italy

^{as} Department of Molecular & Cell Biology, University of California Berkeley, Berkeley, CA, United States

^{at} Medical Research Council Cancer Unit, University of Cambridge, Hutchison/MRC Research Centre, Cambridge, United Kingdom

^{au} Department of Orthopedic Surgery, Nara Medical University, Kashihara, Nara, Japan

^{av} Medicine and Research Services, Veterans Affairs San Diego Healthcare System & University of California, San Diego, CA, United States

^{aw} Department of Medical, Surgery and Health Sciences, University of Trieste, Trieste, Italy

^{ax} Molecular Therapy and Pharmacogenomics Unit, Azienda Ospedaliera Istituti Ospitalieri di Cremona, Cremona, Italy

^{ay} Physics Department, School of Applied Mathematics and Physical Sciences, National Technical University of Athens, Athens, Greece

^{az} First Department of Medicine, University Hospital Schleswig-Holstein, Campus Lübeck, Lübeck, Germany

^{ba} Getting to Know Cancer, Guelph, Canada

^{bb} Duke Molecular Physiology Institute, Duke University Medical Center, Durham, NC, United States

^{bc} Departments of Environmental Science, Microbiology and Immunology, Dalhousie University, Halifax, Nova Scotia, Canada

^{bd} Department of Pathology, New York Medical College, Valhalla, NY, United States

^{be} University of Illinois at Urbana Champaign, Champaign, IL, United States

^{bf} Charles University in Prague, Third Faculty of Medicine, Prague, Czech Republic

^{bg} School of Medical Laboratory and Radiation Sciences, Old Dominion University, Norfolk, VA, United States

^{bh} College of Pharmacy, University of South Carolina, Columbia, SC, United States

^{bi} Tisch Cancer Institute, Mount Sinai School of Medicine, New York, NY, United States

Download English Version:

<https://daneshyari.com/en/article/2023672>

Download Persian Version:

<https://daneshyari.com/article/2023672>

[Daneshyari.com](https://daneshyari.com)