PURDUE
UNIVERSITY

OFFICE OF THE PRESIDENT

October 2012

Dear Attendees,

Welcome to Purdue University and the third International Symposium on Breast Cancer Prevention. Thank you for helping Purdue foster international communication and research on breast cancer prevention. It is an honor to host such a distinguished group of health care professionals, advocates and researchers from around the world.

This symposium is one of many examples of Purdue's mission to collaborate across disciplines and borders to develop transformative solutions to global challenges. Purdue's role in the fight against cancer is a strong one. Our research centers and programs are advancing scientific innovation and ensuring quality care globally. We remain dedicated to improvement of cancer diagnosis and treatment through interdisciplinary collaboration.

Purdue is home to the Center for Cancer Research, a highly successful National Cancer Institute-funded center; the Oncological Sciences Center; and the Bindley Bioscience Center, all of which are sponsors of this symposium.

Among our facilities and faculty committed to cancer research, Purdue's focus on breast cancer in particular is also significant. The Breast Cancer Discovery Group, made up of faculty from across campus, facilities cutting-edge research across the cancer continuum.

Students also participate in Purdue's fight against cancer. The Cancer Prevention Internship Program (CPIP) is funded by a $1.5 million NIH grant and provides undergraduate and graduate students with the opportunity to participate in an innovative interdisciplinary program in cancer prevention.

Those of you gathered here for this important symposium represent an international working group of the best minds in the fields of oncological health research and communication. This symposium presents a unique opportunity to establish international research partnerships, encourage interdisciplinary education, and create a community of scholars dedicated to a sustained international effort in the prevention and treatment of breast cancer.

Thank you all for your efforts. I applaud your work in addressing this global challenge and to improving human life. We hope that this symposium will create new Purdue partnerships and opportunities, and I hope you will make the most of your time on campus.

Sincerely,

Timothy D. Sands
Acting President

Hovde Hall, Room 200 ▪ 610 Purdue Mall ▪ West Lafayette, IN 47907-2040 ▪ (765) 494-9708 ▪ Fax: (765) 494-7875

The goal of this symposium is to bring together global public health actors and advocates, and researchers on breast cancer prevention and nutrition to provide a platform for discussion among scientists, clinicians and other professionals in the biology, epidemiology, medicine, nutrition, communication, education and public policy fields.

The international breast cancer prevention symposium is organized by the international breast cancer & nutrition (IBCN) group.

VISION

The international breast cancer and nutrition (IBCN) project will be a model for primary prevention of non-communicable diseases. It will advance science and inform health communication, provide strategies, and improve public policy on breast cancer prevention. The IBCN will forge global collaborations on research that takes into account culture and environment, including nutrition and lifestyle. This research-based initiative will transcend political, social and economic factors.

VALUES

1. We must discover how to prevent breast cancer onset in addition to diagnosis and treatment.
2. We must understand and be sensitive to cultural values and practices for discovering environmental factors that influence breast cancer onset, and for developing effective primary prevention interventions around the globe.
3. All regions of the world must work together to share research, knowledge and innovations to approach primary prevention of breast cancer because breast cancer is global.
4. Interdisciplinary teams are essential to understand interactions among environment, culture, nutrition, lifestyle and disease development
5. We value integrity in scholarship and applications in disease prevention and the respect of human dignity.

MISSION

The mission of the IBCN project is to foster the development of a community of scientists across disciplines and public health experts dedicated to research on the primary prevention of breast cancer. Within this mission IBCN is also designing an international, multidisciplinary and integrated collaborative program to identify the impact of nutrition on breast cancer onset (and recurrence) and to elucidate the cellular and molecular mechanisms involved in nutrient-induced breast tissue alterations and cancer development. The anticipated outcomes of this program are the development of strategies to diminish breast cancer incidence and/or incidence of aggressive forms of breast cancer based on epidemiological and biological findings related to nutrition and an impact on public policies via information of the public and health authorities.

GOALS

The development of breast cancer prevention strategies will be facilitated through a better understanding of the epigenetic regulation of the genome (i.e., a series of mechanisms resulting in the reorganization of chromatin, and including but not limited to posttranslational histone modifications and DNA methylation, and that control the expression and silencing of genes). An approach is to identify epigenetic factors that influence breast cancer onset in response to the environment. An initial focus is on nutrition since dietary patterns have been associated with breast cancer and nutrients are known to

impact gene expression (nutrigenomics). This approach will be facilitated by the development of novel assessment methods of presymptomatic, normal appearing tissues. Once the diet-epigenetic interactions that protect or weaken the breast epithelium have been identified, it will be possible to develop effective breast cancer prevention strategies that will benefit from innovative methods of delivery (localized treatment, patient-tailored program, etc) and of rapid evaluation of the intervention success. This approach can also be applied to the study of additional environmental factors on breast cancer development (e.g., stress, pollutants).

I. Identify the potential links among diet, epigenomic characteristics and breast cancers.

II. Create new models for understanding the individual and environmental factors that contribute to breast cancer incidence.

III. Design a primary prevention model that can be generalized to examine individual and environmental factors responsible for the incidence of other chronic diseases.

IV. Identify targets and strategies to prevent breast cancer development.

V. Translate discoveries to global communities.

Table of Contents

Concept Paper on the IBCN project

The problem: Breast cancer incidence is rising all over the world, at different rates. Of particular concern is the rapid rise of incidence in low and middle income (LMI) countries where aggressive forms of the disease are seen in young women. The diversity in types of breast cancers can be largely explained by the heterogeneity of gene expression profiles. Gene expression is controlled by the heritage and the environment. Effective lifestyle factors and targeted therapies are practical interventions for disease prevention but have been limited for breast cancer. A recent report by the World Cancer Research Fund has confirmed the link between two nutrition related exposures, obesity and alcohol consumption, and breast cancer incidence. However, developing countries could not be included in the compiled research due to the lack of data, nor could the rise of premenopausal breast cancer incidence be captured in the studies given their large focus in postmenopausal breast cancer. Existing epidemiological data of the relationship between diet and breast cancer poorly address the mechanisms of breast cancer initiation.

The priority: Globally, breast cancer is ranked second in terms of incidence after lung cancer. It is known that lung cancer is largely preventable. Knowing the main environmental cause of lung cancer enabled the WHO to accomplish the unprecedented step of having an international treaty on restricting tobacco use ratified by many countries. Breast cancer is usually the number one cause of mortality of all cancers in women, and is often the number one or two cause of mortality over all diseases in women on a per country basis. Unfortunately, even though the WHO labeled cancer prevention an urgent priority, especially in light of the fast rise of cancer in developing countries, noncommunicable diseases (a category to which most forms of cancer belong) continue to receive far less attention than communicable diseases. Breast cancer, a top priority noncommunicable disease, has now reached a similar level of urgency and likely is largely preventable with appropriate interventions.

The gap: The mechanisms that transition normal breast epithelium into neoplastic tissue are not understood. Only recently, have tools become available to study the breadth of epigenetic variability associated with the control of gene expression and it has not yet been applied to the relationship between environment and breast cancer. The link between diet and risk of breast cancer has not been studied in populations that encompass the diversity of diet, life style affecting energy balance and breast cancer incidence observed around the world. The link may largely relate to the impact of diet on the epigenome. Biomarkers to assess prevention strategies are lacking. The whole infrastructure to do global research is underdeveloped.

The solution: Global interdisciplinary partnerships are needed to frame the questions; to study the relationship between diet and life styles, the epigenome, and breast cancer development; to describe the epidemiology of breast cancer in LMI countries; to develop and assess breast cancer prevention strategies; to develop and evaluate public health communication strategies; to create and implement appropriate cancer prevention policies.

The international breast cancer and nutrition (IBCN) program initiated by Purdue University aims at promoting coordinated, yet country-tailored, breast cancer prevention research all over the world (see website for mission, goals, and infrastructure: http://www.purdue.edu/dp/oncological/ibcn.php). This will be achieved notably through a program focused initially on the impact of nutrition on the epigenome, with the possibility to extend to other environmental factors.

(1) **Sophie Lelièvre** *DVM, LLM (public Health), PhD, Leader, Breast Cancer Discovery Group of the Purdue Center for Cancer Research; Purdue University, USA*

Connie Weaver, *PhD, Head, Department of Nutrition Science, Purdue University, USA and Deputy Director, Indiana Clinical and Translational Sciences Institute, International Breast Cancer and Nutrition Project; Purdue University, West Lafayette, IN, USA*

(2) **Isabelle Romieu***, MD, MPH, ScD, Head, Section of Nutrition and Metabolism; International Agency for Research on Cancer, Lyon, France,*

(3) **Francesco Branca**, *PhD, Director, Nutrition for Health and Development; World Health Organization, Geneva, Switzerland*

Cecilia Sepulveda, *MD, MPH, Senior Adviser, Programme Cancer Control; World Health Organization, Geneva, Switzerland*

AGENDA

Wednesday, October 10

Stewart Center, Room 206

7:30-8:30 am Registration

Welcome

8:30-9:00 am Symposium Co-Chairs
Martine Bellanger, Sophie Lelièvre and Connie Weaver

Symposium Keynote

9:00-10:00 am **Leslie Reinlib**, PhD, Director, Breast Cancer and the Environment Programs, National Institute of Environmental Health Sciences, National Institutes of Health RTP, USA
Lifespan Studies of Breast Cancer and the Environment

10:00-10:10 am break

STATUS OF BREAST CANCER PREVENTION: from around the world

Chair: **Beatrice Wiafe-Addai**, MD, PhD, Peace and Love Hospitals and Breast Care International, Ghana
Co-Chair: **Isabelle Romieu**, MD, MPH, ScD, International Agency for Research on Cancer, Lyon, France

10:10 am-12:30 pm *each session 25 minutes with a 5 minutes Q&A*

Philippe Kadhel, MD, PhD, University Teaching Hospital, Pointe-A-Pitre, Guadeloupe, France
Environmental and Genetic Background of Breast Cancer in French West Indies

Meghan McDonough, PhD, Department of Health and Kinesiology, Purdue University, USA
Physical Activity and Breast Cancer

Tam Donnelly, PhD, University of Calgary-Qatar, Doha, Qatar
Arabic Women's Breast Cancer Screening Practice: Awareness, Knowledge, Cultural Beliefs and Values, and Participation Rates

Emma Brew Abaidoo, Bsc, Msc, Peace and Love Hospital and Breast Care International, Kumasi, Ghana
Triple Negative Breast Cancer Clinical Outcome in Ghana: A Single Institutional Study

Opening Lunch

12:30-2:00 pm **Purdue Memorial Union Ballroom**

Susan Bulkeley Butler Leadership Excellence Lecture
Dorothy Teegarden, PhD, Director NIH-sponsored Cancer Prevention Training Internship Program, Purdue University, USA
Interdisciplinary Cancer Prevention Research: Basic Science to Education

MODELS IN BIOLOGY FOR PREVENTION RESEARCH: from tissue samples to epigenetic analysis
Chair: **Sharon Ross,** PhD**,** Division of Cancer prevention, National Cancer Institute, USA
Co-Chair: **Rabih Talhouk,** PhD, Biology Department**,** American University of Beirut, Lebanon

2:00-3:00 pm	**Panel of experts**: *Defining Models for Research on Primary Prevention of Breast Cancer* - Moderator: **Sharon Ross**
3:00-3:45 pm	**Leena A. Hilakivi-Clarke,** PhD, Department of Oncology, Lombardi Cancer Center, Georgetown, USA *Animal Models to Study Dietary Prevention of Mammary Cancer*
3:45-4:15 pm	**Brittney-Shea Herbert,** PhD, Department of Medicinal & Molecular Genetics, Indiana University at Purdue University Indianapolis, USA *Development of Cell Lines from Morphologically Normal Breast Tissues to Study Breast Cancer Risk* – ***CME Credit offered***
4:15-4:35 pm	break
4:35-5:05 pm	**Sulma Mohammed,** DVM, PhD, Department of Comparative Pathobiology, Purdue University, USA *Spontaneous Carcinoma in Situ in Dogs-a Model of Breast Cancer*
5:05-5:35pm	**Emily Ho,** PhD, College of Public Health and Human Science, Oregon State University, USA *Dietary Histone Deacetylase Inhibitors for Cancer Prevention*

Poster Session

6:30-9:00 pm	**Reception with Welcome Buffet, Dauch Alumni Center**

Thursday, October 11
Stewart Center, Room 206

8:00-8:30 am *registration- continued*

Welcome

8:30-8:35 am **Marietta Harrison**, PhD**,** Associate Vice President for Research, Director, Oncological Sciences Center at Purdue Discovery Park

Symposium Keynote

8:35-9:30 am **Ricardo Uauy,** PhD, London School of Hygiene and Tropical Medicine, University of London, UK
Diet and Cancer Prevention: The World Cancer Research Fund Template

HEALTHCARE AND POLICY MODELS

Chair: **Patricia Boling,** PhD, Department of Political Sciences, Purdue University, USA
Co-Chair: **Martine Bellanger,** PhD, Department of Human and Social Sciences and Health Behavior, EHESP-French School of Public Health, France

15 minutes introduction of the topic by the co-chairs

9:45-10:30 am **Silvana Luciani,** MHSc, Cancer Control Program, World Health Organization, Pan American Health Organization (PAHO)
Promoting Breast Health in Low and Middle Income Countries

10:30-11:00 am **Graciela Sabini,** MD, Cancer Control, Ministry of Health, Montevideo, Uruguay
Breast Cancer Control in Uruguay

11:00-11: 15 am break

11:15-11:45pm **Temeika Fairley,** PhD, Division of Cancer Prevention and Control, Center for Disease Control & Prevention, USA
A Multi-focal Approach to Addressing Breast Cancer in Young Women: Healthcare, Supportive Services and Policy Models

11:45-12:15 pm **Sandra Liu,** PhD, Department of Consumer Science and Retailing, Purdue University, USA
Business Modeling for Primary Prevention Programs

Lunch

12:15-2:00 pm *on your own*; optional visit of Purdue Discovery Park

CATHERINE PEACHEY ORAL PRESENATIONS

Chair: **Connie Rufenbarger,** Director, Project Development for the Catherine Peachey Fund

2:00-3:00 pm **Minyi Zheng**, Graduate Student, Purdue University, USA
Eburamonine and its Derivative: Development of Novel Preventative Agents Against Brain Metastases of Breast Tumors

Dana Bazzoun, Graduate Student, American University of Beirut, Lebanon
Effect of Connexin 43 Loss on Polarity and Initiation of Tumorigenic Pathways in the Phenotypically Normal Mammary Epithelium

Pierre Alexandre Vidi, Postdoctoral Trainee, Purdue University, USA
The Nuclear Architectural Protein NuMA Targets the ISWI ATPase SNF2h to DNA

Salma Abdelmagid, Postdoctoral Trainee, University of Guelph, Canada
The Role of n-3 PUFA in Breast Cancer Prevention Through Mammary Stem Cells and Epigenetics: Work in Progress

NUTRITIONAL MODELS FOR DIVERSITY
Chair: **John Milner** PhD, Director, Beltsville Human Nutrition Research Center Agricultural Research Service, USDA
Co-Chair: **Ricardo Uauy** PhD**,** London School of Hygiene and Tropical Medicine, University of London, UK

3:00-3:40 pm **Connie M. Weaver,** PhD, Department of Nutrition Sciences, Purdue University, USA
How Do We Study the Relationship of Diet and Nutrition and Breast Cancer Prevention? Nutrition 101 – ***CME Credit Offered***

3:40-4:10 pm **Ailsa Welch,** PhD, SRD, RPHN, University of East Anglia, UK
Measurement Errors Issues in Assessment of Nutrition

4:10-4:20 pm break

4:20 pm-4:50 pm **Farah Naja,** PhD, Department of Nutrition, American University of Beirut, Lebanon
Association of Culture Specific Dietary Patterns with Non-communicable Diseases in a Population Undergoing Nutrition Transition: the Case of Lebanon – ***CME Credit Offered***

4:50- 5:40 pm **Panel of experts:** *Defining Nutrition in Research and Healthcare*
Moderator: **John Milner**

5:40- 6:00 pm break

CATHERINE PEACHEY LECTURES (*open to the public*)
Chair, **Mary-Lou Smith**, Research Advocacy Network, USA

6:00-6:30 pm **Susan Clare,** MD, PhD, Indiana University, Simon Cancer Center, Indianapolis, IN, USA
The Normal Breast: What We've Learned So Far – ***CME Credit Offered***

6:30-7:00 pm **Leslie Reinlib**, PhD, Director, Breast Cancer and the Environment Programs, National Institute of Environmental Health Sciences, National Institutes of Health RTP, USA
Breast Cancer Risk and the Environment

7:30 pm **Symposium Party**

Friday, October 12

Stewart Center, Room 206

8:30-9:00 am (registration- continued)

GLOBAL HEALTH VENTURE

Chair: **Julie Goonewardene,** Associate Vice Chancellor for Innovation and Entrepreneurship, President Center for Technology Commercialization, School of Business, University of Kansas, USA

Co-Chair: **Margaret Frempong,** PhD, Kwame Nkrumah University of Science and Technology (KNUST), Kumasi, Ghana

9:00-9:45 am **Angela Brand,** MD, PhD, MPH, Institute for Public Health Genomics (IPHG), Maastricht University, Netherlands
The Public Health Genomics European Network (PHGEN) – Best Practice Guidelines on Innovation to Action in Europe

9:45-10:15 am **Nora Arta Gaveytia**, MD, Department of Basic Medicine, Faculty of Medicine, Montevideo, Uruguay
Challenges in the Implementation of a National Mutidisciplinary Cancer Research Network in Uruguay. The International US-LACRN Breast Cancer Profiling Study as a Model

10:15-10:30 am break

10:30-11:00 am **Nolwenn LeMeur**, PhD, French School of Public Health, Rennes, France
Analyzing Large Heterogeneous Public Health Data Using R

11:00-11:30 am **John Milner**, PhD, Director, USDA, Beltsville Human Nutrition Research Center Agricultural Research Service, USA
Metabolomics: Opportunities and Challenges

11:30 am-12.30 pm **farewell** *(lunch boxes)*

Organizing Committee:

Co-Chair: Martine Bellanger, Professor of Health Economics, Head of the MPH Programs and Deputy Director of the Center for Public Health Policy Analsysis(CAPPS), EHESP- French School of Public Health, France

Co-Chair: Sophie A. Lelièvre, Associate Professor of Basic Medical Sciences, Purdue University, USA; Leader, Breast Cancer Discovery Group, NCI-designated Purdue Center for Cancer Research

Co-Chair: Connie Weaver, Distinguished Professor and Department Head, Director, Women's Global Health Institute, Purdue University, USA; Nutrition Science, Member, IOM;
Deputy Director, Clinical and Translational Sciences Institute-CTSI

Li Yuan Bermel, Managing Director, Oncological Sciences Center and Women's Global Health Institute, Purdue University, USA

Rebecca W. Doerge, Distinguished Professor of Statistics, Purdue University, USA; Director, Statistical Bioinformatics

Ellen Gruenbaum, Professor and Department Head, Anthropology, Purdue University, USA

Joseph Irudayaraj, Professor of Biological Engineering and Deputy Director, Bindley Bioscience Center, Purdue University, USA

Perry Kirkham, Project Coordinator, Office of the Vice President for Research, Purdue University, USA

Sandra Liu, Professor, Department of Consumer Sciences, Purdue University, USA

Meghan McDonough, Associate Professor, Department of Health and Kinesiology, Purdue University, USA

Dorothy Teegarden, Professor and Associate Head for Research, Nutrition Science, Purdue University, USA; Leader, Cancer Prevention and Control Branch, Oncological Sciences Center

Candiss Vibbert, Associate Vice Provost for Engagement, Purdue University, USA

Scientific Committee:

Martine Bellanger (Professor of Health Economics, Head of the MPH Programs and Deputy Director of the Center for Public Health Policy Analsysis(CAPPS), EHESP- French School of Public Health); **Ellen Gruenbaum** (Professor of Anthropology, Purdue University, USA); **Sophie A. Lelièvre** (Associate Professor of Basic Medical Sciences, Purdue University, USA); **Sandra Liu** (Professor of Consumer Science, Purdue University, USA); **Farah Naja** (Professor of Nutrition, American University of Beirut, Lebanon); **Rabih Talhouk** (Professor of Biology, American University of Beirut, Lebanon); **Dorothy Teegarden** (Professor and Associate Head for Research, Purdue University, USA); **Connie Weaver** (Distinguished Professor of Foods and Nutrition, Purdue University, USA); **Beatrice Wiafe-Addai** (Breast Surgeon and CEO, Peace and Love Hospitals and Breast Care International, Ghana)

Advertisement:

Sarah Anderson (Designer/Writer, Purdue University, USA), **Phillip Fiorini** (Senior Communications/Marketing Specialist, Purdue University, USA)

SPEAKERS

Ms. Emma Brew Abaidoo, M. Sc.
Member of Breast Care International (BCI)
Member, International Breast Cancer and Nutrition Project, Ghana
Member, Susan G. Komen Ghana Race for the Cure, LOC
Member, Ghana Biomedical Laboratory Science Association
Member, Association of Certified Chartered Economist (Health Economy student)
Ghana

Ms. Emma Brew Abaidoo is the head of the Biomedical Research Laboratory of Peace and Love Hospitals at Kumasi and Accra in Ghana. She did her thesis at Peace And Love Hospital with Dr. Beatrice Wiafe Addai as her Co-investigator. She has since been involved in the activities of Breast Care International in terms of breast cancer research and advocacy programmes. She is also a research student at the department of Molecular Medicine at Kwame Nkrumah University of Science and Technology, Kumasi. She is a member of Breast Care International (BCI), International Breast Cancer and Nutrition Project (IBCN) in Ghana, Susan G. Komen Ghana race for cure local organizing committee, Ghana biomedical laboratory science Association and Association of Certified Chartered Economist.

Ms. Brew Abaidoo has a B.Sc. Degree in Chemistry and an M.Sc. in Chemical Pathology. Her thesis was on the effect of breast cancer- treatment on kidney and liver functions. Ms Brew Abaidoo's current research interests are on triple negative cancers with emphasis on hormonal status and family history of the breast cancer patients, especially premenopausal women.

Nora Artagaveytia, MD, PhD
Department of Basic Medicine
Faculty of Medicine
University of Uruguay

Dr. Artagaveytia is Adjunct Professor of the Department of Basic Medicine at the University Hospital of the Faculty of Medicine in Uruguay. She is a Medical Doctor specialized in Medical Oncology and obtained a PhD in Biomedical Science in 2006.

She started her activity on education and research in the University in 1988. Her focus of research is prognostic and predictive factors in Breast Cancer, in particular hormone sensitivity and paracrine pathways, as well as BRCA1 dysfunction. Her clinical activity is developed at the Mastology Unit of the University Hospital.

In 1991, she was awarded a two-year fellowship at Centre Léon Bérard, Lyon, France, to get molecular biology expertise and also obtained the European School of Cancer award at a Breast Cancer Symposium for her work on growth factors (1995). She had other fellowships in France in 1998 and 2006 within the frame of governmental agreements.

Since 2008, she is in charge of the Tumor Biobank at the Army Forces of Uruguay which integrate the Latin American and Caribbean Biobank Network. Currently she is the Scientific Coordinator for Uruguay of the US-Latin America Cancer Research Network Project, Molecular Profile of Breast Cancer in Latin American Women.

Martine M. Bellanger
Professor of Health Economics
EHESP – French School of Public Health in Rennes
Paris, France

Martine M Bellanger has been professor of Health Economics at the EHESP French School of Public health in Rennes, France, since 1998. She is also director of the Master of Public Health (MPH). Previously, she taught micro-economics and mathematics for economics at the University of Nantes, in which she wrote her PhD on decision theory and elderly policies in France from 1960 to 1990.

Her main interests for both research and teaching are in economic analysis of health care reform in E.U member states, and economic evaluation. Currently, her particular focus is comparative analysis addressing questions related to funding health care and measuring, health inequalities and evaluation of public health programmes and new technologies. Measuring efficiency in health care is becoming a growing research interest, with a particular attention to hospital services, and to services for patients with Alzheimer diseases.

She has been involved in European research groups linked to the London School of Economics (LSE) and to the European Health Management Association (EHMA) and has contributed in four European projects from 1999: The scientific evaluation of market forces in European Health systems (1999-2000), Analysing the impact of health system change in the EU member States (2001-2002), Mapping health services access -National and Cross-border Issues (2004-2006) and Health Benefits and Service Costs in Europe – Health *BASKET*(2003-2007). She is currently working on a project related to efficiency measurement of hospital services in Europe: EURO-DRG project (2009 & 2012).

Patricia Boling, PhD
Associate Professor of Political Science
International Politics
Purdue Women's Studies
Purdue University, USA

Patricia Boling is a political scientist who works on comparative work-family policies in the United States, Europe, and Japan. Her projects also include a book on public-private distinctions (Privacy and the Politics of Intimate Life, Cornell UP, 1996), an edited book on new reproductive technologies (Expecting Trouble, Westview, 1997), work on what hospitality means to care providers and patients in the context of an oncologist's office, and a essays that combine theoretical and policy-oriented approaches to privacy protections. Professor Boling has been a participant in the International Breast Cancer and Nutrition program since 2009.

Angela Brand, MD, PhD, MPH
Founder and Full Professor
Institute for Public Health Genomics
University of Maastricht
Maastricht, Netherlands

Prof. Angela Brand is Founder and Full Professor of the Institute for Public Health Genomics (IPHG) at the Faculty of Health, Medicine and Life Sciences in Maastricht University, the Netherlands, as well as Adjunct Professor at the Manipal Life Sciences Centre of Manipal University, India.

She is a specialist in Public Health Medicine, Master of Public Health (Johns Hopkins University), Paediatrician; Director of the European Centre for Public Health Genomics (ECPHG), Coordinator of the Public Health Genomics European Network (PHGEN), Full Partner of the EU Flagship Project IT Future of Medicine (ITFoM), President of the Section Public Health Genomics within the European Public Health Association (EUPHA), Editor-in-Chief of the international journal Public Health Genomics, Executive Director of the Public Health Genomics international network GRaPH-Int, Associated Member of the international consortium Public Population Project in Genomics (P^3G) on bio-banking, Advisory Board Member of Alacris Pharmaceuticals, Advisory Board Member of OncoTrack (IMI), Steering Committee Member of the "Forward Look on Personalized Medicine" of the European Science Foundation, Scientific Consultation Group Member of the European Centre for Disease Prevention and Control (ECDC).

She is also expert for the European Agency for Reconstruction, the OECD, WHO, the European Commission, the Netherlands Genomics Initiative (NGI), the German Robert Koch-Institut (RKI), Genome Canada etc. and Fellow of the Rockefeller Foundation; USA, and of the 21st Century Trust of the Welcome Trust, UK.

Susan E. Clare, MD, PhD
Indiana University Simon Cancer Center
Indianapolis, IN
USA

Dr. Susan Clare is both a chemist and surgeon. Dr. Clare completed a doctorate in Chemistry (Bio-organic) at Northwestern University prior to beginning her medical studies. She graduated from Northwestern University's Feinberg School of Medicine in 1990. Following completion of an internship and residency in general surgery at Northwestern, Dr. Clare was a postdoctoral fellow at The National Cancer Institute in Bethesda, Maryland. She returned to Northwestern as a member of the Surgery Faculty and was recruited to Indiana University in 2003. At IU she is a clinical breast surgeon and she also leads a basic science research laboratory.

Dr. Clare and her colleagues, Anna Maria Storniolo, MD and Connie Rufenbarger, Consumer Representative, Catherine Peachey Fund, Inc., founded the Susan G. Komen for the Cure® Tissue Bank at the IU Simon Cancer Center. The Komen Tissue Bank is a biorepository of breast tissue and biospecimens from women without clinical evidence of breast cancer.

Dr. Clare was elected to Alpha Omega Alpha as a medical student. During her residency she received The Compassionate Care Award of the Robert Lurie Cancer Center, which is presented annually by the Women's Board of Northwestern Memorial Hospital. She was awarded the James Ewing Oncology Fellowship for Basic Research by the Society of Surgical Oncology in 1999. Earlier this year, Dr. Clare, Mrs. Rufenbarger and Dr. Storniolo were presented with the Executive Women in Healthcare 2012 Excellence in Leadership Award in recognition of their leadership of the Komen Tissue Bank.

Tam Truong Donnelly, PhD
Associate Professor
University of Calgary
Doha, Qatar

Dr. Tam Truong Donnelly is an Associate Professor at the University of Calgary and Associate Dean for Research at the University of Calgary-Qatar. In Canada, Dr. Donnelly's research studies were funded by the National Cancer Institute of Canada (NCIC) and the Canadian Institutes of Health Research (CIHR). There Dr. Donnelly's research focuses on the Health and Wellness of Immigrants and Refugees which include breast cancer and cervical cancer screening practices, HIV/AIDS, mental healthcare, and support for international nursing students. In 2005, Dr. Donnelly received the Alberta Centennial Medallion Award in recognition for her work with immigrant populations. In Qatar, her research is funded by the Qatar National Research Fund (NPRP and UREP programs).Dr. Donnelly's research focuses on Arab women's breast cancer screening, depression among cardiovascular patients, and lifestyle risk factors that contribute to chronic diseases.

Temeika L. Fairley, PhD
Lead Health Scientist,
Designated Federal Officer, Advisory Committee on Breast Cancer in Young Women (ACBCYW)
Office of the Associated Director for Program Development
Office of the Director
Division of Cancer Prevention and Control
National Center for Chronic Disease Prevention and Health Promotion
Center for Disease Control and Prevention
USA

Dr. Temeika L. Fairley is a Lead Health Scientist with the Center for Disease Control and Prevention's Division of Cancer Prevention and Control (DCPC). She obtained a PhD in biology from the University of Vermont and joined CDC as an Epidemic Intelligence Service Officer in 2001. During the early part of her tenure at CDC, Dr. Fairley developed expertise in public health surveillance and data use development for CDC funded programs. More recently, Dr. Fairley's work has been primarily in the area of cancer survivorship and health disparities. She is the project lead for CDC's efforts to implement the provisions of the Education and Awareness Requires Learning Young (EARLY) Act legislation. EARLY Act directs the Centers for Disease Control to develop and implement communications, research, and program support activities for young women at risk for or diagnosed with breast cancer. In this role, Dr. Fairley also serves as the Designated Federal Officer for the newly mandated federal Advisory Committee on Breast Cancer in Young Women (ACBCYW).

Dr. Fairley's research interests include breast cancer, cancer survivorship, and health disparities. Her breast cancer interests and expertise are primarily in the area of cancer survivorship among women diagnosed before the age of 40.

Margaret T. Frempong, MD
Associate Professor, Molecular Medicine
School of Medical Sciences
Kwame Nkrumah University of Science and Technology
Kumasi, Ghana

Dr. Margaret Twimasiwah Frempong present appointment is Associate Professor, Department of Molecular Medicine, School of Medical Sciences, Kwame Nkrumah University of Science and Technology, Kumasi.

Dr. Frempong is a graduate from the University of Birmingham, Brunel University and University of Science and Technology. She has been head of the Department of Molecular Medicine, head of the Department of Clinical Biochemistry and Deputy Director of the Diagnostic Directorate since 2002.

She is currently a member of Ghana Science Association, Third World Organization for Women in Science and Women in Science & Technology, Ghana.

She is also a member of International Breast Cancer And Nutrition Project, Ghana.

Julie K. Goonewardene
Associate Vice Chancellor for Innovation and Entrepreneurship
President, Center for Technology Commercialization, School of Business
University of Kansas, USA
Board of Trustees American Medical Association

Julie Goonewardene is a recognized leader in technology commercialization, business formation, and public/private partnerships. From corporate board -rooms to university research labs, she brings together groups across the health care spectrum to develop new solutions to medical and business challenges. Based on her successes in these areas, Ms. Goonewardene was recently elected to the Board of Trustees for the American Medical Association (AMA).

In addition to serving in her current role as Associate Vice Chancellor for Innovation and Entrepreneurship at the University of Kansas (KU), she is president of the KU Center for Technology Commercialization and a professor of practice in the KU School of Business. Ms. Goonewardene is responsible for all university-wide commercialization efforts with the intellectual property, company formation, corporate outreach and foundation research relationship groups reporting to her.

Prior to KU, she held various roles at Purdue University. One of her primary focus areas was company formation and capital acquisition for start-up companies. While at Purdue she designed and managed Purdue's first venture fund.

Ms. Goonewardene is an experienced entrepreneur herself, having co-founded and served as president and CEO of Cantilever Technologies, a venture-backed software company that was successfully acquired in 2004. Cantilever's customers were Fortune 500 companies including Cummins, Brunswick and Lockheed Martin. Prior to Cantilever, she was president of the Strategic Systems Group (SSG), a boutique information technology consulting firm, and co-founder of Technology Solutions (TSC), a professional IT services firm which went public three years after its inception.

Ms. Goonewardene is an author and frequent speaker on entrepreneurship and innovation. She has also been appointed to leadership roles on several not-for-profit boards. As a first generation American born to Sri Lankan and Australian parents, she brings a unique global perspective to her endeavors.

Goonewardene earned a B.S. degree with Honors in Management and a Masters degree in Health Communication from Purdue University and is currently a member of The Economic Club of Chicago and The Chicago Finance Exchange. She is married with three children -- a son and twin daughters.

Brittney-Shea Herbert, PhD
Associate Professor, Medical and Molecular Genetics
Department of Pharmacology and Toxicology
Indiana University School of Medicine
Indianapolis, Indiana, USA

Dr. Brittney-Shea Herbert is currently an Associate Professor at Department of Medical and Molecular Genetics and Department of Pharmacology and Toxicology, Indiana University School of Medicine, as well as a Member of the IU Simon Cancer Center.

Dr. Herbert obtained her B. A. and Ph.D. degrees in Biological Sciences, with a focus on nutrition and cancer from The University of Texas at Austin. Dr. Herbert then performed postdoctoral research on aging and cancer, with a focus on breast cancer progression, under the tutelage of Drs. Jerry Shay and Woodring Wright at The University of Texas Southwestern Medical Center at Dallas, Department of Cell Biology.

Among Dr. Herbert's honors are a NASA Graduate Student Research Fellowship, a Susan G. Komen Breast Cancer Fellowship and Investigator-Initiated Award, a DOD Breast Cancer Research Program Postdoctoral Fellowship, funding from the NCI Division of Cancer Prevention, and numerous grants awarded for research in breast cancer.

Dr. Herbert's current research interests are the molecular genetics of aging and cancer, with particular interests in inherited breast cancers, cell culture models, and novel cancer therapeutic and preventative strategies.

Leena Hilakivi-Clarke, PhD
Department of Oncology, Lombardi Cancer Center
Georgetown University
Washington DC, USA

Dr. Hilakivi-Clarke received his PhD in Experimental Psychology and Physiology in 1987 from University of Helsinki, Finland, where she studied the effects of early life exposures to antidepressant drugs on early brain development and affective behaviors using animal models.

Next, during a Fogarty postdoctoral fellowship (1987-1990) at the National Institute of Alcohol Abuse and Alcoholism in Bethesda, Maryland, she studied the role of specific dietary components, including alcohol and amino acids, in affecting neurotransmitter pathways and affective behaviors in mice.

In 1991, she joined the Lombardi Comprehensive Cancer Center (LCCC) and was appointed as a Research Associate Professor of Psychiatry at Georgetown University, Washington DC. Her research focus shifted from diet and behavioral neurosciences towards exploring diet and breast cancer prevention.

Between 2003 and 2010, she was a program director for NCI funded U54 program project entitled "*Timing of dietary exposures and breast cancer risk*" to investigate nutritional modulation of genetic pathways leading to cancer, and from 2010 onwards she has been a project leader in another NCI funded U54 program about "*Systems Biology in Cancer*."

Dr. Hilakivi-Clarke is currently tenured Professor of Oncology, and co-director of Shared Animal Resource, and director of Tumor Biology Master's program at Georgetown University. Currently, she is studying the mechanisms that mediate the effects of maternal dietary exposures during pregnancy on mother's and her daughter's mammary cancer risk and the risk of recurrence of this disease, mostly using pre-clinical models. These mechanisms include changes in mammary gland morphology and gene signaling, also through epigenetic modifications. In addition, one of the key questions her laboratory is focusing is to determine whether soy food intake during childhood influences how soy foods in adult life affect mammary cancer risk and survival. Although most of these studies have been done using animal models, over the past 10 years Dr. Hilakivi-Clarke has been collaborating with epidemiologist to study the role of diet in affecting cancer risk in women. Her publication record consists of over 140 scientific papers and reviews.

Emily Ho, PhD
College of Public Health and Human Science
Oregon State University, USA

Dr. Emily Ho is currently an Associate professor of nutrition and director of the Moore Family Center for Whole Grain Foods, Nutrition & Preventive Health at Oregon State University. She is also a Principal Investigator at the Linus Pauling Institute. Dr. Ho received her PhD in Human Nutrition from the Ohio State University. A major focus of her current research is dietary approaches for cancer prevention. Currently she holds several grants funded by the NIH/NCI to explore the effects of phytochemicals derived from cruciferous vegetables on epigenetic regulation of processes related to colon, prostate and breast cancer prevention. Her work includes both pre-clinical in vitro and in vivo studies and has culminated in several ongoing human clinical trials.

Philippe Kadhel, MD, PhD
University Teaching Hospital
Pointe-A-Pitre
Guadeloupe, France

After receiving his medical degree from Pierre and Marie Curie University, Dr. Kadhel specialized in obstetrics and Gynecology as a resident in Paris' hospitals. He received a master's degree in biology of reproduction option: statistics, informatics and modeling from Paris V in 1994 and another one in physiology of development and functional differentiation in 1997.

Upon his return to Guadeloupe, he joined the medical team in the Department of Obstetrics and Gynecology of the Pointe a Pitre University Hospital Centre. He obtained his PhD in Science of life from Université des Antilles et de la Guyane, 2008. He completed his postdoctoral program at the CHU Sainte-Justine's Research Centre.

Dr. Kadhel has focused his clinical interests in gynecological cancers and his scientific interests in the relations between reproduction and anthropic modifications of environment in the broadest sense.

His research work has contributed to the growing concern about the environmental pollution by a organchorinated pollutant (chlordecone) in Guadeloupe and Martinique (a second FWI). Dr Kadhel is also involved in the development of research in Guadeloupe in general. He was the investigator of the first Guadeloupean study which has received national grant for research.

Nolwenn LeMeur, PhD
French School of Public Health
Rennes, France

After completing engineering schooling in microbiology and food safety in 2000, Dr. LeMeur obtained a PhD in Bioinformatics in 2005 from an INSERM laboratory focusing on cardiovascular and neuromuscular diseases. She developed statistical methods and computer tools for quality assessment and analysis of microarray data. From 2005 to 2008, she worked as post-doctoral graduate at the Fred Hutchinson Cancer Center Research in Seattle, in the Computational Biology Department directed by R. Gentleman. She continued to develop my expertise in quality assessment of high throughput data (protein-protein interaction, flow cytometry). She has also got interests in data mining and graph theory approaches for the integration of heterogeneous biological data and meta-data (including public health data). Back in France in 2008, she did her second post-doctorate to focus on systems biology. In 2009, She joined Ecole des Hautes Etudes en Santé Publique (EHESP) as an associate professor where she teaches biostatistics and develops the use of data mining and graph theory approaches to analyze large heterogeneous data.

Sandra S. Liu, PhD

Professor, Department of Consumer Sciences & Retailing
Director, Center for Global Urban Sustainability-Ensuring Sustainable Health Among Underserved
Purdue University, USA

Sandra S. Liu joined Purdue University as a faculty member in 2001 and is currently Professor in Department of Consumer Sciences and Retailing, Co-Director of Center on Religion and Chinese Society, and Director of International Training for Discovery Park. Dr. Liu earned her PhD in Higher Education Policy from University of London. She holds a MBA from Pepperdine University, an MS in both Preventive Medicine and Pharmacology from the Ohio State University, and a Bachelor's Degree in Pharmacy from Taipei Medical College (Taiwan). She wrote Being Your Own Boss: Entrepreneurship Tools for Market Planning and Execution (2006). She co-authored two books with Philip Kotler of the Kellogg School of Management at Northwestern University, where she was a post-doctoral visiting scholar. The one entitled Rethinking Marketing: Sustainable Market-ing Enterprise in Asia was subsequently translated into Chinese and published in China. Her current research focuses on the area of health policy and strategies that entails (1) understanding of the value propositions of the stakeholders' (including patients, family members, caregivers, administrators, and society at large) and (2) translating the understanding to formulating strategies and operation plans for developing sustainable initiatives/programs that also yield social benefits.

Prior to becoming an academician in 1990, Liu worked extensively in the pharmaceutical industry, with responsibilities ranging from discovery and clinical research to international sales and marketing. She covered territories in the US and many Asian countries. Her consultancies include 3M Hong Kong Limited, Peopleware Inc. (Hong Kong), Bayer healthcare Ltd. (China), and Ascension Health (US). These experiences enriched her teaching for the China MBA programs and executive training programs.

As Director for Center for Global Urban Sustainability, Dr. Liu works to foster partnerships with academic and governmental institutions, local community healthcare providers and school boards, and social entrepreneurs in addressing social determinants of health in North West Indiana, the US and globally at large. In addition to cost-effectively providing healthcare to the underserved population, the metrics for the economic impact and benefits encompass increased job opportunities, development of sustainable urban environment, economic empowerment of the limited-resourced population, learning/lifestyle improvement, and literacy enhancement in reading, nutrition, financial and other societal aspects.

Silvana Luciani, MH.Sc.
Advisor, Chronic Disease Prevention and Control
Area of Health Surveillance, Disease Prevention and Control
Pan American Health Organization

Silvana Luciani is a public health professional who has led international and national health programs on cancer prevention and control, tobacco control, and nutrition. At the Pan American Health Organization, she is responsible for cancer prevention and control activities which includes leading the Regional Strategy for Cervical Cancer, as well as providing policy and technical advice to Ministries of Health on national cancer control issues.

Her scope of work has included conducting cancer program evaluations to improve the effectiveness and impact of screening programs, as well as undertaking operational research projects to evaluate alternative approaches to screening appropriate low resource settings. She is an active partner and has been collaborating in the global Alliance for Cervical Cancer Prevention (ACCP) and the global coalition Cervical Cancer Action (CCA). As a member of the Breast Health Global Initiative (BHGI), she has been collaborating on the development, adaptation and dissemination of breast health guidelines for Latin America. She also leads the CARMEN network, which is composed of Ministry of Health chronic disease program managers, and promotes international collaboration for improved chronic disease management.

Prior to international work, Silvana was with the Canadian federal government, directing national health promotion programs, including leading a task force to create the Canadian Strategy for Cancer Control. She has a Masters of Health Science degree in Community Health from the University of Toronto.

Meghan McDonough, PhD
Associate Professor, Health and Kinesiology
Purdue University, USA

Dr. Meghan McDonough is an Assistant Professor in the Department of Health and Kinesiology at Purdue University. She is a core committee member of the International Breast Cancer and Nutrition Project and a member of the Oncological Sciences Center, the Breast Cancer Discovery Group, and the Global Women's Health Center.

Dr. McDonough's research focuses on social relationships, stress and coping, motivation, and self-perceptions in physical activity. Her work in cancer explores how social relationships and physical activity among cancer survivors contribute to their well-being and how they cope with stress related to cancer and survivorship.

John Milner, PhD
Director
Beltsville Human Nutrition Research Center
Agricultural Research Service,
United States Department of Agriculture

Dr. Milner is currently the Director and Senior Scientist at the USDA Beltsville Human Nutrition Center. From 2000 to 2012, he was Chief of the Nutritional Science Research Group in the Division of Cancer Prevention at the National Cancer Institute. From 1989 to 2000, he was Head of and a Professor in the Department of Nutrition at The Pennsylvania State University, where he also served as Director of the Graduate Program in Nutrition. Before joining Penn State, he was a faculty member for 13 years in the Food Science Department and in the Division of Nutritional Sciences at the University of Illinois-Urbana-Champaign. While at the University of Illinois he served as the Director of the Division of Nutritional Sciences and as an Assistant Director of the Agricultural Experiment Station.

Dr. Milner earned a Ph.D. from Cornell University in nutrition, with a minor in biochemistry and physiology and a B.S. in Animal Sciences from Oklahoma State University. Dr. Milner is a member of several professional organizations, including the American Society for Nutrition, American Association of Cancer Research, American Chemical Society's Food and Chemistry Division, the Institute of Food Technology and the International Society of Nutrigenetics/Nutrigenomics. He is a fellow in the American Association for the Advancement of Science, a fellow of the Institute of Food Technologists, and an Honorary Member of the American Dietetic Association.

He has served in an advisory capacity as a member of the U.S. Department of Agriculture's Human Nutrition Board of Scientific Counselors, Joint USDA/HHS Dietary Guidelines Committee, and for the Food, Nutrition and Safety Committee within the International Life Sciences Institute (ILSI). Dr. Milner has served as president of the American Society for Nutrition (formerly the American Institute of Nutrition) and has testified before the Subcommittee on Appropriations in Washington, D.C. and the Presidential Commission on Dietary Supplement Labels in Baltimore, Maryland. He has served as a member of the National Academy of Sciences Committee on Military Nutrition Research, the U.S. Olympic Committee Dietary Guidelines Task Force, the External Advisory Board for the Pennington Biomedical Research Center, as a member and Vice-Chair for the Counsel of Experts of United States Pharmacopeia Committee on Bioavailability and Nutrient Absorption, a member of the External Advisory Board for the European Commission SeaFood Plus initiative and as the chair of the World Cancer Research Fund/American Institute for Cancer Research Mechanisms Working Group. He is currently a member of the Global Board of Trustees for ILSI, liaison to the International Food Information Council (IFIC), member of the Danone Institute's International Functional Foods and Health Claims Knowledge Center Committee, a member of the Board for the McCormick Science Institute and a member of the Mushroom Research Board. In 2008 he received the David A. Kritchevsky Career Achievement Award in Nutrition from the American Society for Nutrition.

Dr. Milner serves on the editorial boards for *Food and Nutrition Research, Frontiers in Nutrigenomics, Nutrition and Cancer, Nutrfood, Journal of Nutritional Biochemistry, Journal of Alternative and Complementary Medicine, Journal of Ovarian Research, and The Journal of Medical Foods*. He is a Senior Editor for *Cancer Prevention Research*. In his current position he promotes research that deals with the physiological importance of dietary bioactive compounds as modifiers of cancer risk and tumor behavior. Much of his own current research focuses on the anticancer properties of garlic and associated allyl sulfur compounds. In addition to presentations about nutrition and genomics, he has been an invited to speak about garlic and health, selenium nutriture, antioxidants and health, functional foods and health promotion, truths and myths about obesity, and nutrition for cancer prevention.

Farah Naja, PhD
Department of Nutrition
American University of Beirut
Lebanon

Dr. Farah Naja is an Assistant Professor of Nutrition Epidemiology at the department of Nutrition and Food Science at the American University of Beirut (AUB). She completed her Ph.D. in Nutrition Epidemiology at the University of Toronto, Canada. She was trained at Cancer Care Ontario studying diets' effect on various cancers.

Prior to that, she earned a M.Sc. in Therapeutic Nutrition and a B.Sc. in Nutrition and Food Sciences from AUB. Her professional experience includes working as a teaching faculty at the Faculty of Health Sciences, Higher Colleges of Technology (UAE). She also assumed the portfolio of clinical dietician and food quality control supervisor at the American University of Sharjah (UAE).

Dr. Naja's research interests include investigation of the role of diet in the etiology of non communicable diseases including cancer, obesity, diabetes, hypertension and metabolic syndrome. A specific focus of her research is to study innovative approaches to study dietary factors such as dietary patterns as opposed to single nutrient approach and to assess the association of these patterns to various diseases in the Lebanese context.

Leslie Reinlib, PhD
National Institute of Environmental Health Sciences
National Institutes of Health
Bethesda, MD, USA

Dr. Les Reinlib is a Health Scientist Administrator in the Susceptibility and Population Health Branch at the National Institute of Environmental Health Sciences, NIH. He is Director for the Breast Cancer and the Environment Research Program, a nationwide study on the impact of exposures on the predisposition for breast cancer throughout the lifespan, but focusing on specific "windows of susceptibility" such as puberty and pregnancy. He is also Director for the Environmental Health Sciences Core Centers that support broad research on environmental influences in health and disease at major US universities. Dr. Reinlib develops and administers programs in molecular and experimental carcinogenesis, genome integrity, environmental toxicology, and stem cell and developmental biology.

Dr. Reinlib received a BS and MS in biology from the University at Albany and a doctorate in natural sciences and biochemistry from the Swiss Federal Institute of Technology in Zurich. He was on the faculty of Tufts University – New England Medical Center and later the Johns Hopkins University School of Medicine before joining NIH in 1990. Throughout his career, Reinlib has worked with laboratory and clinical investigators focusing on cellular mechanisms of disease pathogenesis. He has published reports on stem cell biology and therapy, genome integrity, environmental origins of lupus, mechanisms of heart failure, and second messenger regulation in a variety of health disorders.

Isabelle Romieu, MD, MPH, ScD
Head, Nutrition and Metabolism Section
International Agency for Research on Cancer
Lyon, France

Dr. Isabelle Romieu obtained her Medical degree (MD) from the Medical School of Montpellier in France with specialty in critical care and anesthesiology and work for several years at a Cancer Institute in France. She obtained postgraduate training in biostatistics and nutrition and later obtained a master of Public Health (MPH) and a doctorate of Science (ScD) in Epidemiology with focus on nutritional epidemiology from Harvard University.

From 1991-2008 she worked in Mexico and Latin American countries first with the Pan American Health organization, then with the National Institute of Public Health in Mexico where she was professor of epidemiology. She has conducted several studies on the risk of breast cancer and was recently awarded for her work in the breast cancer field by the AVON foundation.

She is the PI of a large cohort study on the risk of cancer and other chronic diseases in Mexico. In 2010, she joined the IARC as Head of the section on nutrition and metabolism. She is the author of more than 150 scientific articles and book chapters and widely recognized as an expert in nutritional epidemiology. She has a major interest in studying nutrition, body fatness, physical activity and other life style risk factors in relation to cancer, metabolomics, and gene environment interaction.

Sharon Ross, PhD
Program Director in the Nutritional Science Research Group
Division of Cancer Prevention
National Cancer Institute
National Institutes of Health
USA

Dr. Sharon Ross is a Program Director in the Nutritional Science Research Group, Division of Cancer Prevention, National Cancer Institute, National Institutes of Health. In this capacity, she is responsible for directing, coordinating and managing a multi-disciplinary research grant portfolio in diet, nutrition, and cancer prevention. Topics in her portfolio and research interests include: molecular approaches to diet and pancreatic cancer; diet, epigenetic events, and cancer prevention; nutrition and nanotechnology; as well as diet, obesity and cancer risk.

Dr. Ross has a PhD in Nutritional Sciences from the University of Maryland, College Park and a Masters of Public Health from Johns Hopkins University School of Public Health with an emphasis in Epidemiology. Prior to joining the NCI, Dr. Ross worked at the Center for Food Safety and Applied Nutrition, Food and Drug Administration (FDA). At FDA, she was involved in scientific review and regulation development for health claim labeling. Before FDA, Dr. Ross was a Cancer Prevention Fellow in the Division of Cancer Prevention and Control, NCI. Sharon did her doctoral dissertation research in the Laboratory of Cellular Carcinogenesis and Tumor Promotion at NCI where her research topic concerned the effects of retinoids in growth, differentiation, and cell adhesion. Dr. Ross also holds a MS in Nutritional Sciences from the University of Connecticut and a BS in Nutrition and Dietetics from the University of New Hampshire.

Connie Rufenbarger
Director, Project Development for The Catherine Peachey Fund, Inc.
Warsaw, Indiana
USA

Connie has served as a Breast Cancer Consumer Representative and Advocate for twenty-five years.

As Director of Project Development for the Catherine Peachey Fund, she has focused on providing funding for innovative breast cancer research at the IU Simon Cancer Center, created an annual multi-disciplinary breast cancer research meeting, and The Amelia Project for breast cancer researchers across Indiana.

She currently serves as the Consumer Representative and is on the Executive Committee for the Susan G. Komen for the Cure® Tissue Bank (KTB) at the IU Simon Cancer Center.

The mission of the KTB is to provide specimens that will enable the study of normal mammary development and to provide normal breast tissue controls for breast cancer research. The KTB is a repository of specimens from volunteer donors with no clinical evidence of breast malignancy. The tissue bank currently contains richly annotated core tissue samples with whole blood, plasma and serum from over 3,000 donors.

This project has led to her interest in the development of biorepositories for non-specified reseach. She believes that there will need to be an evolution within the bioethics and Internal Review Board communities in order to expand the public's ability to agree to what they are willing to do within a Clinical Trial rather than being limited in what they are allowed to do in order to advance research.

Connie currently serves as the Consumer Representative for the IU Simon Cancer Center to the Translational Breast Cancer Research Consortium, serving on the Patient Advocate, Endocrine Resistance and Correlative Science Working Groups.

Graciela Sabini, MD
National Cancer Control Plan Ministry of Health
Montevideo, Uruguay

Dr. Sabini was born in Montevideo (Uruguay) in March 2nd 1946. She is a Medical Doctor, specializing in Medical Oncology. She had fellowships to work at Centre Léon Bérard (Lyon, France) (1978) and NCI (USA) (1984) in the area of Hormone Receptors and Cáncer.

For over 35 years, Dr. Sabini worked as a Faculty of Medicine at the Republic University of Uruguay. Previously, she served as Professor of Clinical Oncology. She has been dedicated to education in all her positions. Currently, she is the Director of the National Cancer Control Plan (Ministry of Health) and the Coordinator of the Technical and Professional Training Area of the Honorary Committee to Fight Against Cancer. In the field of oncology, she has been the recipient of Four international scholarships, First prize for the National Medicine Award, Two National Medicine Award. She has published more than 100 scientific articles in the field of oncology. She is also responsible for the creation of and participation in the Mastology Unit and Palliative Care Unit.

Mary Lou Smith, MBA, JD
Co-Founder of Research Advocacy Network
USA

Mary Lou Smith is a Co-founder of the Research Advocacy Network. She is a two-time breast cancer survivor and serves as co-chair of the ECOG Patient Representative Committee and the RTOG Patient Advocate Committee. She also serves on the National Comprehensive Cancer Network (NCCN) Breast Cancer Screening and Treatment Guidelines Committees, the Translational Breast Cancer Research Consortium (TBCRC) and on the Advocate Core of the Department of Defense Center of Excellence for Individualization of Therapy for Breast Cancer and the Advocate Core of the Komen Promise Grant at Indiana University. She was a community member of the Rush University Medical Center Institutional Review Board for 10 years. Mary Lou is past president of Y-ME National Breast Cancer Organization and has served on the Cancer Leadership Council and the National Breast Cancer Coalition's Board of Directors.

Mary Lou has worked in health care for over 20 years in both hospital administration and consulting. She was involved in the development of numerous managed care products for the Blue Cross and Blue Shield Association, including a Pediatric Cancer Network. Mary Lou has a Juris Doctorate with a Health Law Certification and a master's degree in Business Administration

Rabih S. Talhouk, PhD
Biology Department
American University of Beirut
Beirut, Lebanon

The work in my laboratory focuses on two main lines of research. The first has to do with deciphering the mechanisms, at the molecular level, that regulate the interaction of the cell with its microenvironment. For that, different mammary cell culture models are used. The role of the gap junctions, connexins, and their associated proteins, in regulating mammary growth, development and mammary epithelial cell differentiation and transformation are investigated. The second line of research, investigates the claimed anti-inflammatory bioactivities in marine species and Lebanese indigenous plants commonly used in folk medicine. An endotoxin treated mammary cell culture model that mimics inflammation and in vivo animal models are used for that purpose.

Dorothy Teegarden, PhD
Professor, Department of Nutrition Science
Associate Dean for Research and Graduate Programs, College of Health and Human Sciences
Director, Purdue Cancer Prevention Internship Program
Lead, Cancer Prevention and Control Program
Oncological Sciences Center in Discovery Park
Purdue University, USA

Dr. Teegarden is Professor in the Department of Nutrition Science at Purdue University. She currently serves as the Associate Dean for Research and Graduate Programs for the College of Health and Human Sciences. Prior to this appointment, Dr. Teegarden served as the Associate Head for Research in the Department of Nutrition Science. She received her doctorate in Human Nutrition and Nutritional Biology from the University of Chicago. Dr. Teegarden completed a postdoctoral fellowship in the Department of Biochemistry with Dr. Claudia Kent and another with Dr. Connie Weaver in the Department of Nutrition Science, both at Purdue. She has been a faculty member in the Department of Nutrition Science since 1994, and she is also a current Purdue University Faculty Scholar.

Dr. Teegarden is the Director of the NIH funded Purdue Cancer Prevention Internship Program. The primary goal of this unique program is to train both graduate and undergraduate students to work in interdisciplinary research teams with a focus on cancer prevention. The goals of the program are also to prepare and encourage undergraduate students to choose graduate education and to prepare graduate students for successful careers in cancer prevention. In addition to the unique interdisciplinary training students receive, the program is particularly unique because of the rigorous assessment of the outcomes. This program has received national attention due to the strong mentorship of both graduate and undergraduates to enhance their careers in science, and the training they receive to work in collaborative, interdisciplinary teams.

She is also serves as the lead for the Cancer Prevention Program of the Purdue Oncological Sciences Center, a Discovery Park Center, and led the efforts on campus to facilitate the development of research efforts in the area of cancer prevention. Towards this goal, she also leads the newly developed Obesity and Cancer Discovery Group which is a collaborative program with the Purdue Center for Cancer Research and the Women's Global Health Institute.

Her own research has two primary arms, both with a focus on vitamin D molecular actions. First, her laboratory is investigating the impact of vitamin D on cancer progression, primarily breast. Second, she studies the impact of vitamin D on muscle, including insulin sensitivity. She has led studies using a wide variety of techniques from basic molecular to animal to clinical trials. She has over 60 peer reviewed publications and her research has been continuously funded since starting as faculty at Purdue.

Ricardo Uauy, MD, PhD
Professor of Public Health Nutrition, London
School of Hygiene and Tropical Medicine University of London, UK

Dr. Ricardo Uauy received his Medical Doctor University of Chile in 1972 and Ph.D. in Nutritional Biochemistry from MIT in 1977. He was trained in Pediatrics at Harvard Children's Hospital/Boston and Neonatology Yale New-Haven Hospital. He is board Certified in Pediatrics and Neonatal-Perinatal Medicine (USA). He was a past-President of the International Union of Nutrition Sciences (IUNS) from 2005 to 2009 and Director of INTA University of Chile from 1994 to 2002. Presently, Professor of Public Health Nutrition at Institute of Nutrition (INTA) University of Chile and London School of Hygiene and Tropical Medicine, U.K.

He has participated as expert in multiple WHO/FAO expert committees (Protein Energy '81, Fats and Oils '93, FBDGs '95, Vitamin and Minerals '98, Nutrition in the Elderly '98, Human Energy needs '01, chair WHO/FAO Nutrition Diet and Chronic Disease '02, and Global Strategy WHO '03; WHO/FAO Scientific Update on CHO '06 and Trans Fats '07), former chair of FAO/WHO Expert Consultation on Fats and Fatty Acids in Human Nutrition. He has also been a recipient of McCollum Lecture award ASN (USA) in 2000, Lawton Chiles International Lecturer Award NIH in 2003, Spanish Nutrition Society Award and PAHO/WHO Abraham Horwitz award for Leadership in Inter-American Health in 2005; the Kellog's International Nutrition Award from the American Nutrition Society ASN in 2006; the Rank Lecture Award/UK Nutrition Society in 2008 and the 2009 British Nutrition Foundation Prize. He was a member the Chilean Academy of Medicine in 2002 and Member of the Scientific Panel and executive committee of the WCRF World Cancer Research Foundation: Diet Nutrition and Physical Activity Prevention of Cancer Publications 2007 and the corresponding Policy Report 2008. He has authored over 337 scholarly peer reviewed scientific publications.

Connie M. Weaver, PhD
Distinguished Professor and Head
Director, NIH Botanical Center for Age Related Diseases
Deputy Director, Clinical and Translational Science Institute
Purdue University, USA

Dr. Connie Weaver is presently a distinguished professor at Purdue University. In 2010 she was elected to membership in the Institute of Medicine of The National Academies, of which she is a member of the Food and Nutrition Board. In 2008, she became Deputy Director of the National Institutes of Health funded Indiana Clinical and Translational Science Institute. From 2000 to 2010, she was Director of the NIH Purdue-UAB Botanical Research Center to study dietary supplements containing polyphenolics for age-related diseases. Dr. Weaver is past-president of American Society for Nutritional Sciences. She is on the Board of Trustees of the International Life Sciences Institute, National Osteoporosis Foundation and Science Advisory Board Pharmavite.

Her research interests include mineral bioavailability, calcium metabolism, and bone health. She was a member of the National Academy of Sciences Food and Nutrition Board Panel to develop new recommendations for requirements for calcium and related minerals.

For her contributions in teaching, Dr. Weaver was awarded Purdue University's Outstanding Teaching Award. Her honors include the Purdue University Health Promotion Award for Women (1993), the Institute of Food Technologists Babcock Hart Award (1997), USDA A.O. Atwater Lecture Award (2003), the NAMS/Glaxo Smith Kline Consumer Healthcare Calcium Research Award (2006), the Purdue University Sigma Xi Faculty Research Award (2006), and the American Society for Nutrition Robert H Herman Award (2009), the Natural Products Association’s Burton Kallman Scientific Award (2010), and the Linus Pauling Research Award (2011).

Dr. Weaver was appointed to the 2005 Dietary Guidelines Advisory Committee for Americans. She has published over 260 research articles. Dr. Weaver received a Bachelor of Science and Master of Science in food science and human nutrition from Oregon State University. She received a Ph.D. in food science and human nutrition from Florida State University and holds minors in chemistry and plant physiology.

Ailsa Welch, PhD, SRD, RPHN
Department of Nutrition
Norwich Medical School
University of East Anglia, UK

Ailsa Welch is a senior lecturer in nutritional epidemiology at the University of East Anglia Medical School (since 2007). Before this Ailsa was a key researcher for 15 years at the University of Cambridge with the European Prospective Investigations into Cancer Study.

With over 160 publications her research focuses on understanding the importance of diet to human health, disease and ageing, with particular emphasis musculoskeletal health and nutrition, dietary methodologies, dietary fat composition, acid-base balance and public health.

Ailsa is lead of the Metabolic and Endocrine group of the Norfolk and Suffolk Comprehensive Local Research Network. She is an adviser to the UK government for dietary surveys and a member of the scientific advisory committee for the National Osteoporosis Society. She is also a member of the Council of The Nutrition Society, Public Health Nutrition Theme lead and of the editorial board for 'Nutrition Today'. Ailsa is the PI for an initiative developing and evaluating public health interventions in the Norfolk area.

Beatrice Wiafe Addai, MD, PhD
President of Breast Care International
Chief Executive Officer, Peace and Love Hospitals
Ghana

Dr. (Mrs.) Beatrice Wiafe Addai has 22 years experience as a Medical officer in Ghana; thus from 1989 to Date. She has been a Breast Surgeon for the past ten years and a consultant in Breast Cancer Management.

Her training and wide scope of study as a specialist Breast Pathologist and a surgeon has placed her at a convenient exposition as the Chief Executive Officer and the Senior Medical Officer of the Peace and Love Hospital both in Accra and Kumasi; a specialist hospital that is championing the course of Breast Cancer and its related diseases in Ghana.

Dr. Wiafe is a fine role model and inspiration to women and society as a whole. This is due to her charisma and the quest for a unique professionalism as far as patients care and welfare are concerned.

By God's grace and her endowed knowledge, hundreds of women have been healed of various diseases through her directives particularly Breast Cancer.

From a humble beginning nine years ago, Peace and Love Hospital now serves as a resource Centre for the Diagnosis, treatment, Counseling, Rehabilitation, and Research for Breast Cancer, Cervical Cancer, Hepatitis Infections and Renal Dialysis among others.

It is in view of these and other tangible facts and through her innovation and preoccupation of developing the infrastructure of Breast Cancer Advocacy, Breast Care International BCI an NGO that seeks to the promotion of Breast Cancer Awareness in Ghana especially in the Remote communities was concerted in 2002 at Kumasi to intensify public awareness on the disease.

This Public Awareness campaign has salvaged Hundreds of women from the devastating effect of Breast Cancer and its related disease and even men.

On weekends (mostly on Sundays where most women could be reached), after the exhaustive week days, Dr. Wiafe Addai and her able team normally embark on outreach mission among women groups, churches, Second cycle and tertiary institutions, organizations and those marginalized in rural and deprived communities, sometimes at the expense of her own financial and logistical resources.

Dr. Wiafe's passion and aspiration for the prevention, awareness and treatment of breast cancer has earned her an honorable recognition in Ghana and internationally as one of the champions advocating for the eradication of the disease. By dent of her hard work, commitment and meticulous working experience in various environments and her continuous search for better ways of delivering care for Breast Cancer patients, Dr. (Mrs.) Wiafe-Addai is an active international speaker; she has addressed many international conferences and symposiums sharing her rich knowledge about the disease. They include:

1. 4th Roche Middle East Oncology Conference – Malaysia in 2006,
2. The Scientific Conference Of the Kenya Society of Hematology and Oncology in 2006,
3. The European Institute of Oncology 9th Milan Breast Cancer Conference in June 2007,
4. 6th European Breast Cancer Conference in Berlin – Germany in April 2008,

5. The global Race 2009 at Washington DC – United State of America during which she was honored with Dinner with the US vice President Mr. Joe Biden in October 2009.
6. The Nigeria Cancer Conference at Abuja in January 2010,
7. Ghana Breast Cancer Symposium.
8. The International Gold Star for leadership in quality Award in Geneva, Switzerland, in September 2010.
9. Pink Ribbon Red Ribbon forum dubbed "Summit To Save Lives" held Washington D.C, in USA.

Dr. (Mrs.) Wiafe-Addai has also received some international awards including:

1. The International award for Leadership in the Platinum Category, in Paris, France in April 2011
2. The Belgium-based European Society for Quality Research (ESQR) Award.
3. The European Award For Best Practices 2011 (Gold Category) the European Union (EU)
4. The African Global Person for the year 2011

She is also affiliated with the following international organizations:

- She is the Race Chair for the first ever Susan G. Komen Ghana Race for the cure in Ghana.
- Partnership with Loma Linda University of California (LLU) in the United States of America (USA) in the area of collaborative research in Breast Cancer and creation of the first cancer registry in Ghana
- Member of the Global Breast Health initiative.
- International Breast Cancer And Nutrition Project
- Partnership with the National Cancer Coalition (NCC) of USA and
- Krebsallianz

ABSTRACTS

The Role of n-3 PUFA in Breast Cancer Prevention through Mammary Stem Cells and Epigenetics: Work in Progress.

Salma Abdelmagid, Lyn Hillyer, Mira MacLennan, Kate Perez, David Ma, Department of Human Health and Nutritional Sciences, University of Guelph

There is growing evidence that n-3 poly unsaturated fatty acids (PUFA) play a role in breast cancer (BC); however, research is still needed to substantiate their effect and to elucidate their mechanism of action in modifying BC risk. Recently we have provided unequivocal experimental evidence that n-3 (PUFA) modify BC risk. By breeding fat-1 transgenic mice, which are capable of endogenously synthesizing n-3 PUFA from n-6 PUFA, with MMTV-neu(ndl)-YD5 (MMTV) mice, which is an aggressive BC model, we were able to demonstrate that hybrid progeny had a 30% reduction in tumor volume and multiplicity accompanied by! reduced n-6 and enriched n-3 PUFA in tumor phospholipids. Building on these findings, and based on the notions that BC is a genetic and epigenetic disease and that mammary stem cells (MaSC) may serve as target of oncogenic changes, we sought to determine the role of n-3 PUFA in the mammary epithelial cell (MEC) profile. Fat-1 and wild type FVB (WT) mice were maintained on AIG-93G diet, containing 10 % safflower oil. At 6 weeks of age mice were terminated and MEC were isolated by collagenase/hyaluronidase tissue dissociation. Surface expression of CD24 was assessed by flow cytometry to determine specific MEC populations. Caveolae was isolated from MEC and Caveolin-1 protein expression was quantified by western blotting. The fat-1 mouse expressed 65% non-epithelial, 20% myoepithelial and 15% luminal epithelial while the WT mouse expressed 65%, 26% and 9% for non, myo and luminal epithelial cells, respectively. The luminal epithelial population, which exhibits stem cell characteristics, was significantly greater in the fat-1 mouse (P=0.! 005). Results suggest that n-3 PUFA can alter the proportion of MEC in the developing pubertal mammary gland, which may have implications for cancer risk. Future experiments will determine gene expression and global epigenetic profile of MaSC from fat-1 mice compared to WT.

Knowledge and Practices of Breast Cancer Prevention among Women with Family History of Breast Cancer in Ede Metropolis, Osun State, Nigeria.

Ademola Adelekan, Health Promotion and Education Department, College of Medicine, University of Ibadan, Nigeria

Breast Cancer (BRCA) is the commonest malignancy in women comprising 18 % of cancers diagnosed and the second common cause of cancer death. Women with Family History (FH) of BRCA in first-degree relative have a relative risk >4 due to inherited genetic mutation genes. This study was therefore assessed knowledge and practices of BRCA prevention among women with FH of BRCA in the study area. This is a cross sectional study. Snowball sampling technique was used to select 187 women with FH of BRCA. A semi-structured questionnaire was used to obtained data from the respondents. Knowledge of BRCA was assessed on a 20-point scale. Descriptive statistics and t-test were used to analyze the data. The mean age of the respondents was 35.5Â±7.1 years. More than half (57.8%) have no education. Most (85%) were not aware of their susceptibility to BRCA. Many (77.4%) of respondents have family members who had died of BRCA. Respondents mean knowledge score was 9.2Â±3.1. Respondents mostly believed cause of BRCA were spiritual powers (57.9%). Some (35.7%) of respondents did not know cancer can be cured if detected early and 78.5% did not know how Breast Self Examination (BSE) can be done. Educational level of the respondents positively influenced their knowledge (P< 11 years) and nulliparity were 7.2%, 58.7%, 42.8% and 30.7% respectively. Preventive practices among respondents included breastfeeding for longer than 1 year (70.5%) and weight loss (10.9%). Almost all (97.9%) and 57.5% have never performed mammography and BSE. Perceived barriers included fear of discovering abnormality (82.7%) and lack of access to mammography (98.3%). Knowledge of breast cancer was low and incorrect preventive practices exits among respondents. Information, education and communication programme on breast cancer prevention should be intensified for these women.

Li-Fraumeni syndrome patient-derived LFS50 progression cell series as an experimental model for breast cancer prevention research

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Li-Fraumeni syndrome (LFS) is a cancer predisposition syndrome associated with germline mutations in the tumor suppressor gene TP53. Breast cancer (BC) is the most common tumor amongst women with LFS, who have increased risk for premenopausal BC before age 40 and a lifetime risk of 49% by the age of 60. Nonmalignant, human mammary epithelial cells (HMECs) were derived from the contralateral breast tissue of LFS patient (LFS50) undergoing BC surgery. The LFS50 HMEC progression series comprises of pre-immortal (HME50), spontaneous Y immortalized (HME50-5E), hTERT-immortalized (HME50hTERT or HME50hT), and tumorigenic (HMET) which can be modeled to represent breast cancer progression. Gene expressions of the LFS50 series were profiled using HG-U133_Plus_2 Affymetrix chip. By hierarchical clustering, the LFS50 cells were observed to have significant differential expression of genes and ANOVA results revealed that EMTrelated genes (e.g., epithelial membrane protein 3, p= 6.84911E-19; E-cadherin, p=8.66098E-19; and Keratin 5, p= 9.73095E-19) to be the most differentially expressed amongst the LFS50 cells. Ingenuity Pathway Analysis (IPA) confirmed that E-cadherin and Keratin 5 were the top most differentially expressed genes as well as G2/M DNA Damage Checkpoint Regulation (p= 2.67E-05), Estrogen-mediated Sphase Entry (p=3.32E-04) Mitotic Roles of Polo-Like Kinase (p=5.5E-04) as few of the top canonical pathways. Furthermore, to identify the type of breast cancer that LFS50 series could model, the triple negative breast cancer (TNBC) subtyping database tool predicted t hat each of the LFS50 strains could be classified as a different subtype. Finally, as a proof of principle for drug targeting, treatment of the LFS50 series with PRIMA-1, a p53 rescue drug, using 3D cultures resulted in a reduction in acini size of the pre-invasive LFS50 cells ($p<0.05$). Therefore, this progression series can serve as a resource for drug target discovery and breast cancer prevention research.

The nuclear structural protein NuMA influences RNA Pol I distribution and nucleolar perichromatin in the mammary epithelium: Is this an indication of a role in proliferation control for this chromatin organizer?

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An appropriate organization of the epigenome, illustrated by the specific formation of euchromatin and heterochromatin domains in the cell nucleus is crucial for the normal proliferation and differentiation phases of mammary epithelial cells. Therefore, understanding how changes in this spatially organized epigenome might influence breast cancer onset is paramount. The perinucleolar region is a site of heterochromatin compaction during cell cycle exit and breast acinar differentiation, as revealed by immunostaining for H4K20me3 and HP1. We previously had shown that (i) a portion of the Nuclear Mitotic Apparatus protein (NuMA) relocates to the perinucleolus in phenotypically normal breast epithelial cells organized into glandular structures (acini), (ii) induced redistribution of NuMA with function-blocking antibodies in quiescent preneoplastic acinar cells is accompanied with H4K20me3 relocation and cell cycle entry, and (iii) ISWI chromatin remodeling complex protein SNF2h interacts with NuMA (unpublished data, Jayaraman, Abad, & Lelièvre). Here we propose that NuMA regulates chromatin organization both inside and at periphery of the nucleolus, which might be critical for cell proliferation control. By silencing NuMA with small interference RNA (SiRNA), we have observed the disruption of Pol I distribution in the nucleolus, which may indicate rDNA reorganization, and the rearrangement of heterochromatin marker H4K20me3. Furthermore, the number of nucleoli per cell appears to be decreased in NuMA-silenced cells. Interestingly, nucleolar remodelling complex (NoRC) and cohesin complex are known to be responsible for heterochromatin organization in the nucleolus and for nucleolar morphology, respectively, and they both interact with SNF2h. We show here by immunoprecipitation that NuMA interacts with cohesin in growth-arrested breast epithelial cells. NuMA and cohesin also colocalize at the perinucleolus enriched with heterochromatin when Pol I activity is inhibited by the drug actinomycin D. These results warrant further investigation of a possible SNF2h-cohesin mechanism by which NuMA might impact mammary epithelial proliferation control.

Effect of Connexin 43 Loss on Polarity and Initiation of Tumorigenic Pathways in the Phenotypically Normal Mammary Epithelium

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Recent evidence suggest a regulatory role for Connexin (Cx) 43, a gap junction (GJ) protein, in apical polarity establishment, Apical polarity is established via the localization of tight junction complexes at the apex of epithelial cell-cell contacts, against the lumen in which milk is secreted. It is a key property of epithelial tissues that is disrupted early on during tumorigenesis and is necessary for cells to enter the cell cycle, a prerequisite of cell proliferation. However, the mechanism that governs Cx43 role in regulating apical polarity of the mammary epithelium is yet to be revealed. We have demonstrated a Cx43 context dependent tumor-suppressive role mediated partially by a GJ complex assembly that sequesters β-, α-catenin and ZO-1 proteins at the cell membrane of breast epithelial tumor cell lines. We hypothesize that the absence of Cx43 in the non-neoplastic epithelium affects pathways involved in tumor initiation. For this purpose, we stably silenced Cx43 using a Cx43 specific shRNA and a non-specific (NSS) shRNA in HMT-3522 S1 non-neoplastic breast epithelial cells. Cx43-shRNA cells showed a 35% increase in their proliferation rate on day 8 in flat monolayer (2D) culture in comparison to the NSS-shRNA cells. Following the use of 3D cell culture that permits the formation of physiologically relevant epithelial glandular structures (acini), we measured a 38% increase in the size of S1 acini with silenced Cx43 compared to control NSS-shRNA acini. Moreover, silencing Cx43 disrupted epithelial polarity by mislocalizing both ZO-1, a binding partner of Cx43 and a tight junction associated protein, and β-catenin, a binding partner of Cx43 and a key protein in proliferation pathways, as revealed by immunostaining. β-catenin total protein levels were also up-regulated in Cx43-shRNA S1 cells as revealed by immunoblotting. Furthermore, Cx43 silencing induced a down-regulation in protein expression of SCRIB, a key regulator of apical polarity and a tumor suppressor. These results reveal an intimate link in the breast epithelium between Cx43 and several components of the apical pole of epithelial cells that have been involved in tumor onset.

The effects of folic acid on epigenetic modifications associated with apical polarity homeostasis in mammary epithelium

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The present global increase of breast cancer incidence requires a heightened focus on primary prevention by environmental factors, such as nutrition, that induce epigenetic changes protecting epithelial homeostasis. The earliest structural alteration in mammary glandular epithelium units (acini) known to precede breast cancer development is the loss of apical polarity (AP). Therefore, AP maintenance could lead to prevention of breast cancer. Using a three-dimensional human cell culture model, we recapitulate differentiation of non-neoplastic (S1) mammary cells, whereby the formation of tight junctions surrounding a central lumen creates AP in acini, which enables us to study the effects of nutrients on AP homeostasis. We have shown that DNA methylation, an epigenetic modification that controls gene expression, particularly influences the formation of AP. Here we focus on folate, an essential cofactor in the transfer of methyl groups to nucleotides. Dietary folate deficiency is known to induce global DNA hypomethylation, local hypermethylation, and DNA damage, all of which affect the initiation of breast cancer. Paradoxically, folic acid supplementation has been associated with increased breast cancer risk in women. Our hypothesis is that adequate levels of folic acid protect AP through epigenetic mechanisms. Proliferating S1 cells were cultured with either 50% less or 50% more folic acid than the control medium in which they form proper AP. Western blot analysis indicated changes in two DNA methyl-binding proteins, MeCP2 and MBD4, known to reflect DNA methylation status and MeCP2, in particular, is altered in breast cancer. In folic acid supplemented cells, both MeCP2 and MBD4 levels decreased, while folic acid deficient cells showed increases for both proteins. We are currently analysing the accompanying effect on AP. These preliminary results provide rationale to further explore the impact of folic acid on epigenetic factors that may control breast cancer onset.

Seizing the Moment: Monitoring Phosphorylation in Living Cells by Lifetime Imaging

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Tyrosine phosphorylation profiling is known to reveal signaling networks characteristic of breast cancer. Phosphorylation is also known to drive gene expression during breast cancer progression. In this demonstration we will use a peptide biosensor called Abl peptide biosensor as a model to specifically target Abl kinase which triggers up regulated intracellular tyrosine phosphorylation. Strategies using Abl kinase inhibitor to disrupt this neoplastic growth promoting intracellular events, has been implemented, including the use of imatinib. However, drug resistance problem that arises in successful remission upon imatinib treatments is identified as an imminent challenge in clinical trials to treat Leukemia. Therefore, rapid and reliable methods to monitor kinase activity in the light of drug response will help finetune the inhibitor's dose and strategy to prevent relapse and reduce cancer risk. Because tyrosine phosphorylation by Abl kinase is a molecular signalling event that occurs in the complex environment involving the roles of intracellular milieu, singe molecule techniques have the potential to provide localized information of ABl kinase enzymatic activity, localization, and function in the presence of other proteins, not possible by population-based approaches. In this work we use Fluorescence Lifetime Imaging Microscopy (FLIM) and Abl peptide biosensor to visualize Abl kinase phosphoylation in living cells (fibroblast 3T3 cells). FLIM image readout obtained from the lifetime was further decomposed into a separate pixel by pixel matrix of intensity and lifetime. Separated matrix of intensity and lifetime was visualized in 2D and 2.5D by using MATLAB, ORIGIN and Image J. An increase ($P<0.001$) in lifetime (2.2-2.8 ns) of Abl peptide in 3T3 vector and phosphorylated Abl peptide (2.4-3 ns) was observed compared to the control group. After treatment with imatinib a decrease in lifetime and intensity with time was observed, indicating the decreasing molecular ABL kinase phosphorylation event in the cell of interest. We observed elevated lifetime in the cytoplasmic regions in the group representing cells with normal level of phosphorylation compared to those in the control group. Lifetime map shows elevated lifetime in the nuclear area in the group with nuclear over expression of ABl and displays elevated lifetime in the cytoplasmic and nuclear region within the group with corresponding over expression. Our approach paves the way for developing spatiotemporal maps and time correlated study of tyrosine phosphorylating events in live cell conditions. These findings can be used to study breast cancer progression and assess treatment efficacy.

Breast Cancer and Nutrition in Select African Countries

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Breast cancer is well known to have seriously affected female populations throughout the western world, but its incidence has also begun to increase dramatically in developing countries. Breast cancer is thought to be impacted by both culture and nutrition, factors that play rather important roles in one's health as well as in one's acquisition of preventative and curative treatments. Thus, the current project aims to contribute to the International Breast Cancer and Nutrition project by focusing on how human life, culture, and nutrition affect breast cancer incidence and preventative measures and treatments within a sample of African countries, specifically Ghana, Nigeria, Cameroon, Ethiopia, and Kenya. Data were drawn from scholarly articles, anthropological ethnographies and international databases such as Globocan, World Health Organization and the African Development Bank group. Nutritional limitations, food taboos and other beliefs, increased urbanization, body size preferences, and patriarchal interference may be important factors to consider in patterns of breast cancer incidence and access to preventative care. Effective preventative care may be attainable among African, female populations by raising awareness among women of the implications of breast cancer, informing such peoples of the preventative practices available to them, and encouraging a diet rich in Omega-3's and vitamins found in fruits and vegetables.

Finally, it is important to delve deeper into the impact that culture and other outside factors, such as intimate and communal relationships, have upon female nutrition and breast cancer risk among different ethnic groups in the aforementioned countries.

Apical polarity as an architectural assessment of breast cancer risk to study the epigenetic modifications that protect the breast epithelium under the influence of nutrients

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Understanding environmental risk is paramount to breast cancer prevention. Apical polarity (AP) is a hallmark of epithelia which in the breast refers to apical tight junction proteins enclosing the central lumen of ducts as well as acini. Using three dimensional (3D) culture of breast acini, we have previously shown that epigenetic changes accompany apical polarization, a safety brake to cellular proliferation. This relationship is the basis for our hypothesis that protective factors against breast cancer maintain apical polarity through epigenetic mechanisms. Epigenetics refers to mechanisms, other than changes in the DNA sequence, which alter gene expression and encompass at least DNA methylation and histone modifications. Importantly, studying the breast epithelia from women at known breast cancer risk levels might help pinpoint a mechanism between specific epigenetic alterations and the maintenance of apical polarity. Conjugated linoleic acid (CLA), a dietary fatty acid linked to breast cancer protection prevented arachidonic acid-induced AP disruption in HMT-3522 (S1) cells (derived from the normal epithelium of a woman at low breast cancer risk) which are readily capable of forming AP in 3D culture; this protection was accompanied by changes in modified histones involved in gene silencing, H3K9me2 and H3K9me3. Cell lines from normal breast tissue of women at high risk for developing breast cancer, HME50-hTERT cells (TP53 mutation) and HME348 cells (BRCA2 mutation), were evaluated for differentiation in 3D cell culture by immunofluorescence for apical and basal polarity and proliferation markers. These two cell-lines were able to exit the cell cycle (<9% nuclei positive for Ki67) and form basal polarity for Collagen IV (>93%) and Î±-6 Integrin (>91%) but not apical polarity as measured by tight junction marker ZO-1. CLA was used to treat cells with low apical polarity capability. Only H ME50-hTERT acini increased AP formation (36% of acini) when treated with CLA during differentiation in 3-D culture but this was well below the 76% acini with AP observed in the S1 acini. Epigenetic markers are currently being assessed in CLA treated and control HME50-hTERT and HME348 cells.

Spontaneous carcinoma in situ in dogs--a model of breast cancer

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Invasive breast cancer is believed to emerge from pre-existing non-malignant and pre-invasive lesions such as atypical ductal hyperplasia (ADH) and ductal carcinoma in situ (DCIS). In the past, investigators seeking to discover markers of high-risk DCIS used human breast samples from individuals who had undergone surgical excision of the primary premalignant lesion. The presence of a marker in the primary lesion was correlated with subsequent recurrence of DCIS or development of invasive cancer. The weakness of this previous approach is a) the 5 year or longer waiting period for recurrence, and b) the lack of a documented clonal relationship of subsequent lesions to the original premalignant lesion. We have characterized a novel model system for studying breast cancer progression that overcomes the aforementioned biologic limitations and temporal constraints, and meets a further requirement that any model of premalignant progression should spontaneously progress within the native breast. Our model is the spontaneous progression of ADH and DCIS in dogs. We have documented remarkable similarities of canine lesions to human lesions (Antuofermo E, 2007; Mouser P, 2010; and Mohammed SI, 2011). Like humans, dogs have spontaneously naturally occurring breast cancers. Besides developing mammary tumors spontaneously, pet dogs share a common environment with humans, more outbred than laboratory rodents, and certain breeds are at increased risk for developing mammary tumors. We have shown that histologic and molecular features of spontaneous canine mammary pre-cancerous are strikingly similar to those of the human breast. In addition, mammographic and ultrasound images of these canine lesions are similar to humans and display calcification pattern specific for each lesions. The similarities of mammographic images and the ability of BI-RADS to predict canine mammary malignances with high specificity and sensitivity further confirm and strengthen the value of dog as a model to study breast pre-malignancies progression and cancer prevention

Trends in breast cancer incidence rates in Lebanon: role of the nutrition transition

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Background: Lebanon is witnessing rapid rates of urbanization and modernization, with concurrent changes in dietary patterns and significant increases in nutrition related diseases including some types of cancer. Concomitantly, Lebanon is classified among the countries with the highest breast cancer incidence in the region. More alarming is the preponderance of breast cancer among relatively younger individuals (less than 50 year-old) in Lebanon as compared to Western countries.

Objective: The aim of this study is to examine secular trends in breast cancer incidence rates in Lebanon and their potential association with dietary variables as nutrition transition is unfolding in the country.

Methods: Data on breast cancer rates were collected from the National Breast Cancer Registry and from scholarly papers. Food consumption data were derived from published dietary investigations, and food availability data from the Food and Agriculture Organization Statistical Database.

Results: Age-adjusted incidence rate of breast cancer has increased by almost four fold between 1965 and 2007. Parallel to this, Lebanon has experienced a noticeable shift in food consumption patterns towards higher intakes of saturated fat, refined carbohydrates and lower intakes of dietary fiber. Food availability data suggest a consistent increase in energy supply (2314 vs. 3107 kcal/day between 1961 and 2007), with a concurrent increase in the proportion of energy derived from fat (23% vs. 32%), sugar (8.6% vs. 11.1%) and a decrease in the contribution of cereals (50.3% vs. 32.5%) and fruits (7.5% vs. 4.7%).

Conclusion: Lebanon has experienced a remarkable increase in breast cancer incidence during the last 4 to 5 decades, which may be at least in part ascribed to the simultaneous nutrition transition that the country has witnessed. Epidemiological studies examining dietary patterns in relation to breast cancer risk are needed to give a better understanding of the role of nutrition as an environmental determinant of breast cancer.

Strategies in Empowering Women in the Rural Areas with Knowledge in Breast and Cervical Cancers

Sylvia Okyere, Breast Care International, Kumasi, Ghana, Africa

Breast Care International (BCI), is a Non Governmental Organization in Ghana that seeks to create awareness and actively engaged in organizing outreach programs, educating the public on various issues of Breast and Cervical Cancers and conducting free screening exercises across the country. With a concerted effort, the scope of our activities has been extensively focused on the remotest areas of the country and among organized groups with the ultimate aim of creating awareness to as many women as possible in country.

To empower the young generation, BCI is actively engaged in awareness creation on Breast and Cervical Cancer among the secondary and tertiary institutions. Worldwide cancer rates including breast cancer are on the rise and late presentation of breast cancer has been our major problem in Ghana. Hence early detection and treatment has been our focus at BCI. Among the key Factors that account for the late presentation of Breast and Cervical Cancer in Ghana are Lack of awareness, myths, misconceptions and poverty. BCI in her ardent desire to wage a vigorous war against the diseases has initiated various strategies to solve the problem. Prominent among strategies used by personnel of BCI in their education drive include the following;

1. Talks aimed at demystifying Breast and Cervical Cancers as incurable diseases.
2. Testimonies by survivors; question and answers.
3. Clinical Breast and Cervical examination of participants.
4. Teaching of Breast Self Examination backed by pictures and flyers as a guide
5. Breast and Cervical Cancers, in spite of their life-threatening potential are curable if detected at an early stage.
6. Not all problems with the breast and cervix are cancers.
7. Mastectomy (Breast removal) is not the only available solution/option for breast cancer surgery. Breast Conservation is another possibility. The type of surgery depends on the condition of the patient
8. All breast and cervical disorders experienced should be reported to the nearest health facility for prompt diagnosis and intervention which is half the chance for cure.
9. Most cases are referred to specialist TOO LATE when the cancers have reached advanced stage spread to other parts of the body.

It is universally acclaimed that a healthy individual is a great asset to him/her self and the nation at large. Conversely, a sick and unhealthy individual is a great liability to self and the nation. BCI believes firmly that sound health especially of the deprived women in our rural areas is a great asset that empowers the rural folk to embark on productive economic ventures that extricates them from poverty and hunger. Women threatened by diseases especially Breast and Cervical Cancer have very little time to attend to their traditional economic roles and are, therefore, depended on other relatives for support and survival. It is on these facts that Breast Care International seeks to empower women on effective decision making relating to their own health002E

Enhanced Diagnostics of Digital Mammograms

Sharanya Padmanabhan, Rajeswari Sundararajan, Department of ECET, Purdue University

Mammography is an imaging system that uses low dose x-rays for examining the breasts. The use of screening mammography is associated with the detection of breast cancer at an earlier stage and smaller size, resulting in a reduction in mortality [1]. This study was aimed at enhancing the accuracy (diagnostic) of digital mammograms using simulation software tools and working on identification of tumor cells to segment them in terms of different stages of the disease. Study reports indicate that dense breasts can make traditional mammograms more difficult to interpret [2]. Although newer digital mammography techniques claim for better detection in dense breast tissues, the availability of such expensive digital mammograms is not widespread [2]. This problem can be minimized by analyzing the different breast structures (mammograms) using an image analysis software, MATLAB. Our proposed solution has proved to be an effective way of detecting breast cancer in different types of breast tissues with the available digital mammograms after the incorporation of certain image processing techniques.

References:

[1]http://www.phsor.org/Alaska/MedStaff/digitalmammography.htm, December 2011
[2]http://www.mayoclinic.com/health/mammogram/AN01137, December 2011

Understanding triple-negative breast cancer progression: through the eyes of Lens epithelial derived growth factor (LEDGF).

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Breast cancer is a heterogeneous disease encompassing several distinct subtypes with different clinical and treatment outcomes. Hence it is imperative to identify specific targets that drive the disease initiation or progression for effective therapeutic intervention, notably for the treatment of aggressive and treatment resistant triple-negative breast cancers (TNBC) lacking the expression of estrogen, progesterone and HER2 receptors. The transcriptional co-activator lens epithelium derived growth factor (LEDGF) has been implicated in leukemia, stem-cell fate determination and its mRNA levels are mostly decreased in noninvasive and invasive breast cancers (BCs). LEDGF protects cells from oxidative stress (OS), a feature of TNBC. The OS-induced reactive oxygen species (ROS) is implicated in breast cancer initiation and progression and in breast cancer stem cells associated tumorigenicity. Yet the role of OS in TNBC remains unclear. Our hypothesis is that LEDGF regulates oxidative stress in the cancer stem cells of TNBC and might participate in their invasive progression. We show that the HMT-3522 basal-like TNBC progression model cultured in the presence of MatrigelTM with preinvasive Ductal Carcinoma In Situ S2 cells and Invasive Ductal Carcinoma S2-derived T4-2 cells mimics the drastic loss of cancer stem cells, observed in vivo, as high grade breast cancers become invasive. LEDGF protein expression is greatly reduced in T4-2 tumors, including in remaining cancer stem cells compared to S2 tumors. Also the expression of LEDGF within S2 cancer stem cells decreases with increasing nodule grade. When the S2 and T4-2 cells are treated with OS-inducing hydrogen peroxide, the protein levels of LEDGF and LEDGF-regulated anti-oxidant protein 2 (AOP2) are increased in S2 but not in T4-2 cells compared to the untreated controls. These encouraging results warrant further investigation of the impact of changes in LEDGF expression on the behaviour of pre-invasive TNBC cells.

Adenovirus-mediated EphrinA1 expression in breast cancer cells induces apoptosis and inhibits tumor progression in a mouse model

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Receptor tyrosine kinase EphA2 is overexpressed in several cancers and offers an attractive cell surface target for cancer therapy. EphrinA1, the EphA2 ligand, down-regulates EphA2 expression and inhibits tumor progression. Infection of breast cancer cells with human adenovirus (HAd) expressing secretory form of EphrinA1 (HAd-EphrinA1-Fc) was growth inhibitory and tumor suppressive. In this study, we explored the growth inhibitory mechanism of HAd-EphrinA1-Fc and performed a comparative phenotypic, genomic and proteomic analysis. The effects of HAd- EphrinA1-Fc expression were compared in normal (MCF-10A) and breast cancer (human MDA-MB-231 and mouse MT1A2) cell lines. In vitro infection of cancer cells with HAd-EphrinA1-Fc revealed strong cytotoxic effects with reduced cell viability, and an altered cellular and nuclear morphology. The apoptotic cell death was indicated by an enhanced Annexin V staining in cancer cells. In addition, treatment of cancer cells with HAd-EphrinA1-Fc was associated with enhanced maspin, cyclin-dependent kinase inhibitor (p21) and tumor necrosis factor gene expression. HAd-EphrinA1-Fc treatment was also associated with reduced expression of Bcl-2 family proteins, cleavage of Caspase-3 and Poly ADP Ribose Polymerase (PARP) proteins. The evidence of EphrinA1-Fc-mediated apoptosis was confirmed in FVB/N immunocompetent mouse model of breast cancer. Furthermore, a single or three intratumoral inoculations of HAd-EphrinA1-Fc in early or established mammary tumors in mice substantially inhibited the tumor progression. Taken together, our results strongly suggest a potential use of adenovirus vectors expressing EphrinA1 for therapeutic intervention of breast cancers.

The nuclear architectural protein NuMA targets the ISWI ATPase SNF2h to DNA breaks

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Maintenance of genomic integrity is essential for breast tissue homeostasis. The importance of the DNA damage response (DDR) in preventing breast cancer onset is particularly evident: the major genetic defects increasing breast cancer susceptibility are mutations in DDR genes. Chromatin remodeling plays an active role in the DNA damage response (DDR). The current view is that remodelers, including members from the ISWI family, shape the chromatin landscape to facilitate the repair process and to restore damage sites after repair. The ISWI ATPase SNF2h rapidly accumulates at sites of DNA damage but the mechanism leading to its stabilization at DNA breaks is unknown. Our previous studies have linked the nuclear architectural protein NuMA to chromatin organization during breast epithelial differentiation and to H2AX phosphorylation (γH2AX), an early chromatin response to DNA damage, leading us to propose that NuMA coordinates large scale chromatin rearrangement during the DDR. Here, we identify NuMA as a binding partner of SNF2h. NuMA silencing impairs SNF2h recruitment at DNA breaks in laser-microirradiated cells, and fluorescence correlation spectroscopy measurements indicate that NuMA regulates SNF2h diffusion in the nucleoplasm. Although NuMA distributes throughout the nucleus during the interphase, it significantly accumulates at microirradiated sites. Moreover, NuMA knock-down impairs homologous recombination repair (HRR) and leads to a premature loss of γH2AX in irradiated cells. Both HRR and γH2AX maintenance have previously been linked to the function of ISWI complexes. NuMA might provide a dynamic lattice reinforced at DNA damage sites, which is paramount for the targeting and stabilization of chromatin remodeling complexes. Our previous work has established a mutual influence between NuMA and the extracellular matrix during mammary epithelial cell differentiation. NuMA may therefore act as a transducer of micro-environmental cues on nuclear organization, thereby regulating genome functions and maintenance.

The Protein-Tyrosine Kinase Syk Regulates Apoptosis through PKA in breast cancer cells

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Reactive oxygen species (ROS) contribute to tumor initiation and progression and serve as well as inducers of apoptosis. Proteins that modulate cellular responses to oxidative stress are important promoters and suppressors of tumorigenesis. One such protein is Syk, a cytoplasmic protein-tyrosine kinase known to enhance the survival of cells exposed to oxidative stress. Thus, Syk is an important survival factor for multiple cancer cell types. For example, the growth and survival of subsets of adult myeloid leukemia, chronic lymphocytic leukemia, diffuse large B cell lymphoma, and non-Hodgkin lymphoma are dependent on Syk, which enhances their resistance to ROS-induced cell death. We hypothesize that this activity of Syk is a function of the substrates that it phosphorylates. To begin to explore this, we applied a phosphoproteomics approach using mass spectrometry in breast cancer cell lines to identify the major Syk substrates that are phosphorylated in the subcellular compartment (nucleus) in which Syk exerts its major anti-apoptotic activity. We hypothesized that one or more of the protein substrates identified in this screen will be important mediators of Syk-dependent cell survival. In this study, we focused on the characterization of an important signaling protein, Protein Kinase A (PKA). PKA participates in multiple cell survival pathways that involve other proteins such as CREB, Bcl-2, Par-4, etc. We used a combination of molecular and cellular biology approaches to determine how the phosphorylation of PKA modulates its activity and its participation in pro- or anti-apoptotic pathways. We found that PKA is a novel substrate of Syk and the phosphorylation by Syk changes its activity dramatically. By understanding the signal transduction pathways through which Syk enhances cell survival, we hope to identify important signaling molecules and pathways that might lead to new therapeutic targets for cancer prevention and treatment.

Haematological Tests for Iraqi Breast Cancer Women Treated with Chemotherapies

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Purpose: To study the effect of chemotherapy on breast cancer by using haematological parameters in order to treatment decision making based on blood constituents in women breast cancer receiving chemotherapy.

Methods: Blood collection from 50 Iraqi breast cancer women of age (35-65years) and median age was 50.4 years. They were collected from medical radiation hospital, Baghdad , Iraq . The histological type was ductal carcinoma of breast cancer with different grades and different tumor stages. The patients were received combination of drugs to make better chemotherapy treatment a success such as 5-Flurouracil and adriamycin and endoxan. The haematological tests include haemoglobin and haematocrit and platelets and white blood cells counts.

Results: From the data obtained that the histological grade was 3(50case) in grade 1 and 24 from 50 case in grade 2 and 20 of 50 case was in grade 3 and 3 in the grade 4 . The average of Hemoglobin was between 11-12.8 g/dl with Adriamycin and endoxan and 5-Flurouracil and haematocrit around 32 to 36L/L and White cell count about 4800 cell/ml to 9000cell /ml and platelets number still in normal value ranging from 160000 cell to maximum value 287000 cells and these values were ranged from three months to almost one year or one year and half.

Conclusion : The results seem to be that the combined treatments of chemotherapies can maintain the normal values and prolong survival time and that reflect that the vital organs were well functioning along the different periods

Eburnamonine And Its Derivative: Development Of Novel Preventative Agents Against Brain Metastases Of Breast Tumors.

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Breast cancer is the most commonly diagnosed cancer in women (excluding skin cancer) and is the second most deadly malignancy after lung cancer. While survival rates for women with breast cancer have been steadily improving over the last decade, metastatic disease is still the leading cause of death from breast cancer, with 5-year survival rates for women with metastatic disease remaining below 20%. Bone, lung, brain, and liver are the most common sites of secondary spread of breast cancer. Brain metastases arise from highly aggressive disease and often afflict younger patients with triple negative or triple negative and Her2 positive primary tumors. Since there are currently no effective therapies against brain metastases, the best approach is in the prevention of the formation of these metastases. Here we propose to investigate a plant derived natural product, eburnamonine (EBN), and it's chemical derivative, and its chemical derivative, 15-methylene-EBN (15-M-EBN), 15-methylene-eburnamonine (15-Me-EBN) as preventative agents against brain metastases of breast tumors. EBN is a pharmacologically active compound derived from the flowering plant Periwinkle and exhibits vasoregulatory and anti-hypoxic properties. It has also demonstrated to cross the blood-brain-barrier and has been tested as a treatment for a number of cerebrovascular disorders, including ischemia and anoxia. EBN has no known neurotoxicity, in fact it has been found to be neuroprotective with no reported side effects. This allows for the potential of EBN to be taken as a dietary supplement. We have tested the effectiveness of EBN and 15-M-EBN in targeting metastases in MDA-231-BR (triple negative breast cancer cells) and MDA-231-BR-Her2 (Her2 positive breast cancer cells) that specifically migrate to the brain. We have found 15-M-EBN is especially effective in causing apoptosis and increase in oxidative stress in these cancer cells. Furthermore, we have tested the ability of these drugs in overcoming environmental mediated drug resistance (EM-DR) using various 3-D cultures and coatings of various extracellular matrix (ECM) component proteins. Our data show that EBN and 15-M-EBN is effective in targeting metastatic cancer cells by causing apoptosis of these cells. Thus, EBN and its derivative meet all the criteria for potential agents to prevent brain metastasis from breast cancer.

1,25 dihydroxyvitamin D regulation of energy metabolism in MCF10 human breast epithelial cells

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These studies were designed to investigate the impact of 1,25-dihydroxyvitamin D (1,25D) on metabolic reprogramming during early cancer progression. Untransformed and ras-oncogene transfected (ras) MCF10A human breast epithelial cells were used to model early breast cancer progression. Metabolite fluxes at the cell membrane were measured by a nanoprobe biosensor, [13C6] glucose flux by 13C-mass isotopomer distribution analysis of media metabolites, and intracellular metabolite levels by NMR following four-day 1,25D treatment. Reduction in glycolysis by 1,25D was supported by a reduced flux of glucose to 3-phosphoglycerate by 15% and 32% in MCF10A and ras cells, respectively. In the ras cells, 1,25D reduced lactate dehydrogenase activity by 15% with a 10% reduction of glucose flux to lactate and the level of intracellular lactate reduced by 55%. Reduction in tricarboxylic acid (TCA) cycle activity by 1,25D was supported by 24% and 41% reduced glucose flux to acetyl-coA, and 34% and 33% reduced glucose flux to oxaloac etate in the MCF10A and ras cells respectively. Moreover, 1,25D reduced oxygen uptake by 20% in the ras cells, another hallmark of tumor progression. This study is the first to show a novel mechanism by which 1,25D may prevent breast cancer progression through regulating glucose metabolism.

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