

international breast cancer & nutrition working together for prevention

SECOND INTERNATIONAL SYMPOSIUM ON BREAST CANCER PREVENTION:

epigenome, nutrition, and public policy

October 9-11, 2011

French School of Public Health (EHESP), Rennes, France













SPONSORS FOR THE 2011 INTERNATIONAL BREAST CANCER PREVENTION SYMPOSIUM:

Center for Public Health Policy Analysis (CAPPS)

Chair of Institut National de la Prevention et de l'Education pour la Santé
Conseil Régional de Bretagne
Ecole Des Hautes Etudes En Santé Publique (EHESP)
Institut National de Prevention et d'Education pour la Santé (INPES)
International Breast Cancer & Nutrition (IBCN)
Oncological Sciences Center, Purdue Discovery Park
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Purdue Global Policy Research Institute
Purdue Susan Bulkeley Butler Center for Leadership Excellence
Purdue University Office of the Provost
Purdue Women's Resource Network
Rennes Metropole
Susan Bulkeley Butler Institute

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DIRECTION

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Wednesday 28th September 2011

Welcome to Ecole des Hautes Etudes en Sante Publique (EHESP- French School of Public Health) and thank you for attending the Second International Symposium on Breast Cancer Prevention. It is an honor to be host to such an international group of health care professionals, advocates and world class researchers sharing the same global vision for preventing breast cancer.

One of the missions of EHESP-French School of Public Health is to develop research networks; this symposium is a tremendous opportunity to create interdisciplinary partnerships that are necessary in order to take on the prevention of breast cancer as a public health challenge. Our interdisciplinary research centers, such as the Center for Public Health Policy Analysis, in addition to conducting cutting edge research, are enhancing the necessary links between public health disciplines and policy makers. Our faculty and students are committed to the advancement and promotion of scientific innovation.

Intercontinental collaboration, and the collaboration between EHESP and Purdue University which has led to this symposium as an example, is an essential component in addressing global health – related issues like breast cancer. We are pleased to bring together numerous public health experts from across the globe to provide a forum for discussion on such a crucial issue.

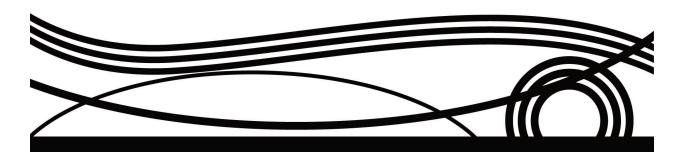
Prof. Antoine Flahault, MD, PhD

Dean, EHESP School of Public Health, Rennes - Sorbonne Paris Cité, France

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École des hautes études en santé publique



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.

VISION

The international breast cancer and nutrition (IBCN) project is focused on breast cancer prevention research to inform health communication, interventions, and public policy. This project benefits from a global perspective through the establishment of culturally aware multidisciplinary and international collaborations.

The development of breast cancer prevention strategies will be facilitated by a better knowledge of the epigenetic regulation of DNA (i.e, a series of mechanisms resulting in the reorganization of chromatin, in particular, via posttranslational histone modifications and DNA methylation, and that control the expression and silencing of genes). One way to identify epigenetic factors that influence breast cancer development in response to the environment is to focus on nutrition since dietary patterns have been associated with breast cancer and nutrients are known to impact gene expression (nutrigenomics). Once the diet-epigenetic interactions that protect or weaken the breast epithelium have been identified, it will be possible to develop breast cancer prevention strategies.

MISSION

The mission of the IBCN project is to develop an international multidisciplinary collaborative program to identify the impact of nutrition on breast cancer development and recurrence and to elucidate the cellular and molecular mechanisms, including genomics (genetic and epigenetic influence), involved in nutrients-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

- 1. Assemble an international collaborative breast cancer prevention research network that takes into account ethnic and cultural backgrounds;
- 2. Work with experts involved in all aspects of breast cancer control, including cancer biologists, epigeneticists and geneticists, epidemiologists, nutrition experts, clinicians, bioengineers, statisticians, communication experts, law and public policy experts, anthropologists, education experts, healthcare professionals, and economists;
- 3. Collaborate with national and international organizations that focus on breast cancer control and environmental impact issues;
- 4. Identify the links between dietary patterns, epigenomic characteristics and aggressive forms of breast cancer;
- 5. Develop research projects aimed at identifying targets and directions to prevent breast cancer development and translate the findings into projects for the design of prevention strategies and
- 6. Develop an integrated training program in breast cancer prevention research and applications that promotes transcontinental and cross-disciplinary learning.

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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.

<u>The solution:</u> 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



International Symposium on Breast Cancer Prevention

October 9-11, 2011

French School of Public Health, Rennes, France

Sunday, October 9

Mercure Hotel

3:30 p.m. Registration Opens

4:00-4:30 p.m. Welcome and Introduction, **Connie Weaver** & **Martine Bellanger**

Session on Country Updates

Session Chair: Joan Lappe, Creighton University, USA

Co-Chair: Eric Breton, Head of the Chaire INPES (National Institute for

Prevention and Health Education), EHESP, France;

4:30-7:00 p.m. Status on Breast Cancer Prevention... from Around the World

Temeika Fairley, Center for Disease Control, USA;

Title: Global Issues in Breast Cancer

Chisato Nagata, Gifu University, Japan;

Title: Diet and endogenous hormones: implications for breast cancer prevention

in Japan

Isabelle Romieu, International Agency for Research on Cancer, France;

Title: Lifestyle and breast cancer: Perspective for prevention

Alvaro Ronco, University of Montevideo, Uruguay;

Title: Nutritional patterns: towards a primary prevention of breast cancer

Rabih Talhouk, American University of Beirut, Lebanon;

Title: Status of Breast Cancer in Lebanon and Directions of Research

Beatrice Wiafe-Addai, Peace and Love Hospital and Breast Care International,

Ghana;

Title: Breast Cancer Prevention, Global Challenge, Experience from Ghana

David Ma, University of Guelph, Canada;

Title: Is there a role for omega-3 fatty acids in breast cancer prevention?

7:00 p.m. Buffet

Monday, October 10

EHESP School of Public Health

7:30-8:30 a.m. Registration Continues

8:30-8:45 a.m. Welcome from **Marie-Aline Bloch**, Director of Research EHESP, France;

Session on Breast Epigenome and Cancer

Session Chair: Miguel Musé-Sevrini, University of Montevideo, Uruguay;

Co-Chair: Nolwen Le Meur-Rouillard, EHESP, France;

8:45-9:30 a.m. Open Forum: Panel of Epigenomic Experts; History and future of epigenetics in

cancer research

9:30-9:55 a.m. Speaker: **Sophie Lelièvre**, Purdue University, USA;

Title: Impact of Epigenetic Alterations in Early Stages of Breast Cancer

Development

9:55-10:20 a.m. Speaker: Catherine Duggan, Fred Hutchinson Cancer Research Center, USA;

Title: Associations of telomere length with serum biomarkers, nutrient intake, and anthropometric measurements in 438 postmenopausal overweight

sedentary women

10:20-10:30 a.m. Break

10:30-11:30 a.m. Symposium Keynote: Susan Bulkeley Butler Leadership Excellence Lecture:

Mina Bissel, Lawrence Berkeley National Laboratory, USA;

Title: Form and Function: The Dominance of Tissue Architecture in Mammary

Gland and Breast Cancer

11:30-12:00 p.m. Special Topics: Breast Cancer in Uruquay- Current Status: Diego Touya and

Miguel Musé-Sevrini, University of The Republic, Uruguay;

12:00-12:30 p.m. Speaker: João Breda, WHO European Regional Office and the Nutrition, Physical

activity and Obesity Programme (NAO), Denmark;

Title: Nutrition Policy to Prevent Breast Cancer in WHO European Region

12:30-2:00 p.m. Lunch

2:00-3:00 p.m. Poster Session

Session on Public Policy and Genome/Epigenome

Session Chair: **William Sherlow**, EHESP, France; Co-Chair: **Sandra Liu**, Purdue University, USA;

3:00-3:40 p.m. Session Keynote: **Dominique Stoppa-Lyonnet**, Comité Consultatif National

d'Ethique (National Advisory Ethics Committee) and Department of Genetics,

University Paris Descartes, France;

Title: Personalized genomic medicine: when genetics meets environment

3:40-4:10 p.m. Speaker: **Elena Ambrosino**, Institute for Public Health Genomics (ECPHG),

University of Maastricht, Netherlands;

Title: The Role of Public Health Genomics in Cancer Genomics and Personalized

Healthcare

4:10-4:30 p.m. Break

4:30-5:00 p.m. Special Topic: **Anna-Maria Storniolo**, Indiana University School of Medicine,

USA;

Title: Breast Cancer Prevention: Putting It Into Practice

5:00-5:45 p.m. Round Table Discussion: International Policy on Bioethics - How

Does it Apply to the Epigenome?

Discussion Chair: Martine Bellanger, EHESP, France;

City Hall of Rennes

6:30 p.m. Reception, The Mayor of Rennes welcomes IBCN participants at the City Hall

Taverne de la Marine

7:30 p.m. Symposium Dinner

Tuesday, October 11

EHESP School of Public Health

9:00-9:50 a.m. Opening Keynote: François Goldwasser, Cochin Teaching Hospital, France;

Title: Breast Cancer, Epigenome, Environment and Ethical Considerations

Tools for Epigenomics/Epigenetics

Session Chair: Eve Devinoy, INRA, France;

Co-Chair: Rabih Talhouk, American University of Beirut, Lebanon

9:50-10:30 a.m. Session Keynote: **Sharon Ross**, National Cancer Institute, USA;

Title: Diet, Epigenetic Modulation and Cancer Prevention

10:30-11:00 a.m. Speaker: Joseph Irudayaraj, Purdue University, USA;

Title: Single Molecule-based Epigenetic Analysis

Break 11:00-11:20 a.m.

11:20-11:50 a.m. Speaker: Adele Murrell, Cambridge Research Institute, UK;

Title: DIRAS3 and a macroRNA associated with the locus are imprinted and

function as tumour suppessors in breast cancer

11:50-12:15 p.m. Speaker: Susan Knox, Europa Donna, Italy;

Title: BREAST HEALTH DAY- advocating for prevention and healthy lifestyle

12:15-1:45 p.m. Lunch

1:45-2:45 p.m. Students Presentation:

Session Chair: Candiss Vibbert, Purdue University, USA;

2:45-3:00 p.m. Break

Session on Epigenome, Nutrition and Modeling

Session Chair: John Milner, National Cancer Institute, USA;

Co-Chair: Fara Naja, American University of Beirut, Lebanon;

3:00-3:30 p.m. Speaker: Karen Lillycrop, University of Southampton, UK;

Title: The effect of early life nutrition on the epigenome: implications for the

prevention and treatment of breast cancer

3:30-4:00 p.m. Speaker: Eve Devinoy, National French Agricultural Research Institute, France;

Title: Nutrition at puberty and mammary gland development

4:00-4:15 p.m. Break 4:15-4:45 p.m. Speaker: Rebecca Doerge, Purdue University, USA;
 Title: Large Scale Epigenome Analysis 4:45-5:15 p.m. Speaker: Mary Beth Terry, Columbia University, USA;
 Title: Detection of Women at High Risk of Developing Breast Cancer via Epigenetics 5:15-6:15 p.m. Round Table Discussion: *The Importance of Nutrition in Prevention Action and Policy:*

Discussion Chair: John Milner, National Cancer Institute, USA

Organizing Committee:

<u>Co-Chair:</u> 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;

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

<u>Co-Chair:</u> Connie Weaver, Distinguished Professor of Nutrition Science, Purdue University, USA; Deputy Director, Clinical and Translational Sciences Institute-CTSI

Dorothy Teegarden, Professor of Nutrition Science, Purdue University, USA; Leader, Cancer Prevention and Control Branch, Oncological Sciences Center

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

Joseph Irudayaraj, Professor of Agricultural and Biological Engineering, Purdue University, USA

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

Strategic planning:

Sandra Liu (Professor, Department of Consumer Sciences, Purdue University, USA); **Perry Kirkham** (Project Coordinator, Office of the Vice President for Research, Purdue University, USA)

Logistics:

Candiss Vibbert (Associate Vice Provost for Engagement, Purdue University, USA), **Kris Swank** (Project Coordinator, Oncological Sciences Center, Purdue University, USA), **Céline Lefebvre** (Assistante pédagogique, Département Sciences Humaines, EHESP, France)

Advertisement:

Sarah Anderson (Designer/Writer, Purdue University, USA), **Phillip Fiorini** (Senior Communications/Marketing Specialist, Purdue University, USA), **Tim Newton** (Director External Relations and Communication, Purdue University, USA), **Angela Roberts** (Designer/Writer, Purdue University, USA)



Elena Ambrosino, Ph.D.

Institute for Public Health Genomics Maastricht University Maastricht, the Netherlands

Dr. Elena Ambrosino is currently Senior Researcher within the Institute for Public Health Genomics (IPHG) at Maastricht University (UM, The Netherlands). There, she is the Manager of the Genome-based Research and Population Health International (*GRaPH-Int*) Network administrative hub and project supervisor of the Public Health Genomics European Network (PHGEN) II European project. In addition she is also working as Associate Editor of the 'Public Health Genomics' Journal.

Before joining UM, Elena was based at the Tropical Institute of the French Army (IMTSSA, Marseille, France), were she conducted Public Health research on clinical epidemiology of *P. falciparum* malaria in Sub-Saharan Africa. Earlier she completed a 3-years Post Doctoral fellowship at the National Cancer Institute (NIH, USA) in the field of Tumour Immunology, studying the immune regulation in tumour bearing hosts.

Her education background includes an advanced Degree in Medical Biotechnology and a PhD in Immunology and Molecular Biology from the University of Torino Medical School, and post-graduate studies in the field of Public International Health at the Swiss Tropical and Public Health Institute (Basel, Switzerland).

Mina J. Bissell, Ph.D.

Distinguished Scientist, Life Sciences Division Faculty, Comparative Biochemistry, UC Berkeley Ernest Orlando Lawrence Berkeley National Laboratory Berkeley, California, USA

Dr. Bissell is a pioneer in the area of the role of extracellular matrix (ECM) and microenvironment in regulation of tissue-specific function with special emphasis in breast cancer, where she has changed some established paradigms. She earned an A.B. with honors in chemistry from Harvard/Radcliffe College and a Ph.D. in bacterial genetics from Harvard University. She joined the Lawrence Berkeley National Laboratory in 1972, became Director of Cell & Molecular Biology in 1988, and was appointed Director of all of Life Sciences in 1992. Upon stepping down as the Life Sciences Division Director, she was named Distinguished Scientist. She is also the OBER/DOE Distinguished Scientist Fellow in Life Sciences.

Dr. Bissell has authored more than 315 publications, is a member of 7 international scientific boards, and is on the editorial board of a dozen scientific journals, including Science magazine. She has given more than 90 'named and distinguished' lectures. Her awards include the Lawrence Award and medal, the Mellon Award from the University of Pittsburgh, the Eli Lilly/Clowes Award from AACR, the first "Innovator Award" of the US DOD for breast cancer research, the Brinker Award from Komen Foundation, the Discovery Health Channel Medical Honor and medal, the H. Lee Moffitt Cancer Center Ted Couch Lectureship and Award, the Pezcoller Foundation—AACR International Award for Cancer Research, the 2007 Inserm International Annual Award, and the 2008 Excellence in Science Award from FASEB. She was awarded the 2008 Mina J. Bissell Award by the University of Porto and the 2008 American Cancer Society's Medal of Honor for Basic Research Award. In 2009 she was awarded the Rothschild-Mayent Fellowship by Institut Curie. In 2010 she was awarded the American-Italian Cancer Foundation's The Alexander Bodini Foundation Prize for Scientific Excellence in Medicine and in 2011, The Breast Cancer Research Foundation's Jill Rose Award for distinguished biomedical research.

Dr. Bissell was elected as a Fellow of the AAAS, the Institute of Medicine of the National Academies, the American Academy of Arts and Sciences, the American Philosophical Society, the Royal Society of Chemistry, and the National Academy of Sciences. She served as President of the American Society of Cell Biology and the International Society of Differentiation. She has received honorary doctorates from Pierre & Marie Curie University in Paris and the University of Copenhagen.

Joao Joaquim Rodrigues Silva Breda, Ph.D.

Programme Manager: Nutrition, Physical Activity and Obesity WHO Regional Office for Europe Copenhagen, Denmark

He graduated has a Ph.D. in Nutritional Sciences at the Porto University. Heis also graduated in Nutritional Sciences at Porto University, has done his Master Degree in Public Health by the Medical Sciences Faculty of the University Nova de Lisboa and an MBA from the European University in Barcelona.

He was the Portuguese representative in the WHO-Europe for the area of Nutrition and Physical Activity and in the European Union and also the focal point from Portugal in the European Network on Nutrition and Physical Activity, at the High Level Group on Nutrition & PA and the European Platform on Diet, Nutrition and Physical Activity of the EU.

First and former Coordinator of the National Platform against Obesity under the Portuguese Ministry of Health.

Worked as a Public Health Nutritionist at the General Health Directorate in the Portuguese Ministry of Health.

Developed competencies in public health, epidemiology, lifestyles intervention and management based on the successful attendance of the following courses: *Advanced Course in Nutritional and Lifestyle Epidemiology*, Wageningen Agricultural University; *Alcohol and Drug Studies*, Rutgers University - State University of New Jersey; *Erasmus Summer Programme*. Erasmus University - Rotterdam (advanced courses in epidemiology and biostatistics); *European Educational Programme in Epidemiology* - Florence. *Mediterranean School of Biostatistics and Epidemiology*, Calabria; *Health Services Management* - Harvard School of Public Health.

Published in scientific journals and presented in national and international congresses, several dozens of papers and also published 14 original books. He was the recipient of 17 National and International Grants and research awards.

He was Professor of Nutrition at the University Atlântica and Head of Department of the Nutritional Sciences.

Eve Devinoy, Ph.D.

Senior Scientist Research Unit Director, INRA-UR1196 Génomique et Physiologie de la Lactation (GPL) Jouy-en-Josas, France

Eve Devinoy graduated from the Ecole Nationale Agronomique (National Agronomics School) in Rennes in 1975 and from the Institut National Agronomique (National Agronomics Institute) Paris Grignon in 1976. She then trained for three years in the "Physiologie de la Lactation" research unit under the supervision of L.M. Houdebine, studying the control of rabbit milk protein synthesis by glucocorticoids; she defended her PhD thesis in Biochemistry in 1978.

She joined INRA (French National Agricultural Research Institute) as a junior scientist in 1978. In 1979 and 1980, she completed her training in the biochemistry and genetics of eukaryotic Systems, in developmental biology and in membrane structure and function" and then spent almost two years as a Visiting Fellow at NIH-NCI, in the laboratory headed by Dr P. Gullino. Moving back to Paris, she started her work on milk protein genes with the help of Dr. J.A. Lepesant, at the IRBM, Paris. She returned to L.M. Houdebine's research unit at INRA, Jouy-en-Josas in 1981 to work on the cloning of rabbit milk protein genes. She then identified a distal regulatory region in one particular milk protein gene. When this distal region was linked to heterologous genes, it could control the expression of foreign genes in the mammary gland during lactation. A patent was therefore filed and is still being used by a private company, "BioProtein Technologies".

At the end of 2000, she decided to create her own research group and moved to Dr J. Djiane's laboratory to continue her favorite research program, on distal regulatory regions and chromatin organization around milk protein genes. In parallel, she organized a PhD training course for the Université de Versailles St Quentin en Yvelines-Evry Val d'Essonne on the control of eukaryotic gene expression. This annual, one-week training course has been running ever since.

In 2003, her group joined the new research unit set up by Dr M. Ollivier-Bousquet on the genomics and physiology of lactation. The team has two main projects. The first is to understand the control of milk protein gene expression by lactogenic hormones through modification of the chromatin structure and nuclear organization. The second is to unravel the mechanism underlying the long term effects induced by obesity at puberty on mammary gland development and milk production, and secondary effects on the growth of the next generation.

Since 2008, Eve Devinoy has been Director of the "Génomique et Physiologie de la Lactation" Research Unit. Her involvement in the study of epigenetic modifications during normal development of the mammary gland, and her long term collaboration with Dr M. Rijnkels (CNRC-Baylor, Houston, USA) led her to be Guest Editor for a special issue of the Journal of Mammary Gland Biology and Neoplasia in 2010.

Rebecca Doerge, Ph.D.

Professor; Department of Statistics Head, Director of Statistical Bioinformatics Graduate Purdue University, Indiana USA

R.W. Doerge has been employed at Purdue University since 1995 where she holds a joint appointment between the Colleges of Agriculture (Agronomy; 25%) and Science (Statistics; 75%).

Prior to joining Purdue Dr. Doerge was a postdoctoral fellow at Cornell University.

Dr. Doerge received a Ph.D. in Statistics from North Carolina State University in 1993 under the direction of Dr. Bruce Weir, and a Masters in Mathematics (University of Utah) under the direction of Simon Tavare' (now at University. Since joining Purdue University in 1995 Dr. Doerge has published over one hundred papers in the area of statistical genetics, genomics, and epigenomics, and has won many awards for both teaching and research: Teaching for Tomorrow Award (1996); Outstanding Assistant Professor for Excellence in Teaching and Research (1997); Outstanding Teacher of Undergraduates in the School of Science (1998); University Scholar (2001); College of Science Graduate Student Mentoring Award (2007). Dr. Doerge was promoted to Associate Professor of Agronomy and Statistics in 2000, Full Professor of Agronomy and Statistics in 2003. In 2007 Rebecca was elected a Fellow of the American Statistical Association, and a Fellow of the American Association for the Advancement of Science (AAAS). Professor Doerge served as the Interim Head of Department (Statistics) for the academic year 2008-2009, and in 2010 won the Provost's Award for Outstanding Graduate Faculty Mentor.

Temeika Fairley, Ph.D.

Epidemiologist, Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and Health Promotion
Division of Cancer Prevention and Control
Comprehensive Cancer Control Branch
Clinical Translation and Scientific Support Team
USA

Dr. Temeika L. Fairley is an epidemiologist with the Centers 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, working with several surveillance systems including, the Behavioral Risk Factor Surveillance System (BRFSS), the National Immunization Survey (NIS), and the National Program of Cancer Registries Cancer Surveillance System (NPCR-CSS). In her current position as Epidemiologist in the Comprehensive Cancer Control Branch, Dr. Fairley works closely with funded programs to address surveillance data needs and promote more comprehensive use of public health surveillance data for programmatic purposes.

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

François Goldwasser, M.D., Ph.D.

Head of the Medical Oncology Department, Cochin Hospital Professor in Medical Oncology, Paris Descartes University Paris, France

François received Certifications in Clinical Pharmacology (Paris XI University), Pharmacokinetics (Paris VI University), Oncological Pharmacology (Paris VII University), France in 1990 & 1991.

In 1992 was Certified in Molecular Biology (Paris V University, France). And also received a Masters in Molecular and Cellular Pharmacology of anticancer agents (Pierre et Marie Curie, Paris VI University, France).

He received his MD in Medical Oncology (Paris XI University, France) in 1993 and PhD in Molecular and Cellular Pharmacology of Anticancer agents (Pierre et Marie Curie, Paris VI University, France) in 1995. A post-doctoral universitary degree in pallliative care (Paris XI University, France) on 1996 and received the Highest degree in Sciences (Paris V University, France) in 2000.

Joseph Irudayaraj, Ph.D.

Professor of Biological Engineering Bindley Bioscience Center/Birck Nanotechnology Center Purdue University, Indiana, USA

Dr. Irudayaraj has degrees in Biosystems Engineering and Computer Sci¬ences from University of Hawaii and Purdue. He has held faculty positions at Penn State and Utah State University prior to joining Purdue University in 2005. Primary focus of their group at Purdue is on multiplex mechanistic sensing and quantification of molecular markers, genetic material, and drugs in single cells using nanomaterials and single molecule spectro¬scopic and imaging platforms. Their group has developed technologies based on Raman spectroscopy and plasmonics to detect mRNA and protein aggregation in live cells. Using single molecule fluorescence methods they have defined the stoichiometry of histone modifications/variants in mononucleosomes and dynamics of modifications in living cells.

He has published over 200 refereed journal articles in areas relating to nanosensors and SERS-based approaches for cancer detection and diagnosis. He serves in the Nanotechnology for medicine and biology and molecular technology development review panels for NIH, NSF, and DOD as well as agencies in Canada, Europe, and Asia. He is a member of American Chemical Society, Institute of Biological Engineering, Biophysical Society, and the American Society of Agricultural and Biological Engineers

Susan Knox

Executive Director
EUROPA DONNA
The European Breast Cancer Coalition
Piazza Amendola 3
Milan, Italy

Susan Knox is a two time breast cancer survivor and has been Executive Director of Europa Donna since 1999. She is responsible for all on-going European advocacy initiatives in the areas of information, education and lobbying including Pan European advocacy conferences, meetings and information sessions at the European Parliament, European Breast Cancer Advocacy Training Courses, publications and websites. Recently her work has focused on a breast cancer prevention initiative- BREAST HEALTH DAY, which was launched on 15 October 2008.(see website www.breasthealthday.org and now takes place annually.

In addition, Susan represents ED on numerous other projects: TransBIG /MINDACT trial Committees, Project Director on ECN-European Cancer Network, advisory committees of several European Commission projects and European Breast Cancer Conferences(EBCC). She is a speaker on patient advocacy at various international conferences and courses and has written widely on the subject. In 2009 she was also named advocacy editor of the scientific journal "The Breast".

Prior to joining Europa Donna, Susan held various managerial positions in both the corporate and non profit sectors .For 12 years she worked for Citibank as a Vice President in branch management and strategic planning and for 10 years at a non-profit long-term care facility for the aged where she held positions as music therapist, activities director and finally as Assistant Executive Director.

Susan holds a B.A. degree from Smith College and an M.A. degree from Columbia University

Sophie A. Lelièvre, D.V.M., LL.M Public Health, Ph.D.

Leader, Breast Cancer Discovery Group NCI designated Purdue Center for Cancer Rersearch Associate Professor of Basic Medical Sciences Purdue University Indiana, USA

Dr. Lelièvre is a native of France who obtained her undergraduate degree as engineer in Veterinary Sciences from the University of Louvain (Belgium) and her D.V.M. degree from the University of Liège (Belgium) in 1990. She worked as a veterinarian in the emergency room in Paris area (France) from 1990 to 1995, while pursuing M.S. and Ph.D. graduate studies in Cancer Pharmacology (organization of the cell nucleus in chemoresistance and cancer cell behavior) at the Gustave Roussy Cancer Institute and University of Paris VI (Pierre & Marie Curie). Dr. Lelièvre is the 1995 recipient of (i) the National Prize for Fundamental Cancer Research/young investigator from the French Society of Cancer and National Federation of Cancer Institutes and (ii) the National Alexandre Joel Prize for young investigator from the Association for Cancer Research. As a postdoctoral scientist in Mina Bissell's laboratory at the Lawrence Berkeley National Laboratory (USA) from 1995 to 2000, she studied the role of the organization of the cell nucleus in normal and cancerous breast epithelial cell behaviors using three-dimensional models of cell culture.

Dr. Lelièvre joined the Department of Basic Medical Sciences at Purdue, as a faculty member and Walther Cancer Institute Scholar, in October 2000. Her research program has been externally funded by the National Institutes of Health, the Department of Defense-Congressionally Directed Medical Research Programs (CDMRP) and the Susan G. Komen Breast Cancer Foundation. It focuses on the role of the organization of the cell nucleus in gene expression and genome stability and the relationship between tissue polarity and nuclear functions, notably epigenetics. Translational projects are targeted towards early detection and prevention of breast cancer. She was one of the three featured breast cancer researchers of the CDMRP in 2008 in recognition for her contributions to breast cancer research since her early career development funding by CDMRP in 1997.

To better integrate public health related disciplines to her research projects, Dr. Lelièvre completed a Master's degree in Law, Health and Ethics from a EuroPubhealth and Erasmus Mundus international program in 2008 at the University of Rennes (France). She initiated an international program on breast cancer prevention, epigenomics and nutrition (IBCN project) in 2009 that has received logistic support from the World Health Organization. Dr. Lelièvre was selected as a Purdue Entrepreneurial Leadership Academy Fellow in 2009 and Scholar in 2010 to pursue aspects of this international program.

Dr. Lelièvre teaches Applied Pharmacology in the DVM and Lafayette Center for Medical Education (LCME) programs. She also teaches in the Cancer Prevention Internship Program (CPIP) and developed an International Breast Cancer Prevention course at Purdue University. She is an invited lecturer on cancer prevention in the international Master of Public Health of the French School of Public Health in France.

Karen Lillycrop, Ph.D.

School of Biological Sciences University of Southampton UK

Dr Karen Lillycrop is a Senior Lecturer in the School of Biological Sciences at the University of Southampton.

Karen obtained her first degree in Chemistry and Biochemistry at Imperial College, London followed by her doctorate in Biochemistry at the University of Leicester. She then undertook post-doctoral research at University College London in Professor David Latchman's laboratory where she studied gene regulation and the role of transcription factors in disease. In 1995 Karen moved to Southampton to take up a lectureship in Molecular Biology at the University of Southampton.

Karen's current research is focused on how early life environment influences the epigenetic regulation of genes and the development of human disease. She in collaboration with Dr Graham Burdge (Institute of Human Nutrition, University of Southampton) was the first to demonstrate that maternal diet can alter the epigenetic regulation of key transcription factors within the fetus.

Karen has been awarded a number of research prizes including the Nick Hales Award 2007 for outstanding contribution into the developmental origins of health and disease. She collaborates extensively with research groups within Southampton as well as with groups in the Netherlands, Singapore and Auckland. The group is funded by project grants from BBSRC and EU and is part of the Epigen Research Consortium.

David Ma, Ph.D.

University of Guelph Canada

Dr. Ma obtained his PhD in Medical Sciences in 2001 at the University of Alberta conducting research on the anticancer properties of ruminant fats, specifically, conjugated linoleic acids in breast cancer. He then moved to Texas A&M University where he did postdoctoral research with investigating the role of omega-3 fatty acids and folate in colon cancer. He returned to Canada where he joined the Department of Nutritional Sciences at the University of Toronto as an Assistant Professor in 2004. Then, in 2007 joined the faculty in the Department of Human Health and Nutritional Sciences at the University of Guelph where he is currently an Associate Professor.

The long term objective of Dr. Ma's research program is to increase our fundamental knowledge of the role of dietary fatty acids in breast cancer with the goal of developing strategies for the prevention and treatment of cancer. Current research is focused on how omega-3 fatty acids modify mammary gland development, cell membrane structure/function, signaling, and nutrigenomics.

John Milner, Ph.D.

Chief of the Nutritional Science Research Group Division of Cancer Prevention National Cancer Institute USA

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 has published more than 200 book chapters, monographs and journal articles. He 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, and nutrition for cancer prevention.

Adele Murrell, Ph.D.

Cancer Research, Cambridge Research Institute UK

I did my undergraduate studies in South Africa followed this with a PhD in the Dept of Haematology, University of Cambridge, working on transcription factors that regulate haemopoiesis. After my PhD, I did a post doctoral training at the Babraham Institute in Cambridge with Professor Wolf Reik and examined the mechanisms of Genomic Imprinting at the IGF2-H19 locus.

This was followed by another post doctorate at the Sanger Institute working on the Human Epigenome Project. In 2005 I received a Senior Cancer Research Fellowship and started my own group in the Dept of Oncology in Cambridge University.

I moved my group to the CRUK Cambridge Research Institute in 2007. We work on Epigenetics and Genomic Imprinting in Cancer and are mechanistically interested in DNA methylation and hydroxymethylation, chromatin looping and the role of CTCF in chromatin boundaries, polycomb proteins and epigenetic memory and long non coding RNA.

Ignacio Miguel Musé-Sevrini, M.D.

College of Medicine University of Montevideo Uruguay

- Professor and director for oncology services at the School of medicine hospital (1987-2004)
- Several academic positions in biochemistry, internal medicine, and endocrinology at the faculty of medicine (1966-2004).
- Vice-president of the honors board against cancer (from its inception (1991) Present)
- Director of the National Cancer Institute State Health services administration / Ministry of Public Health (ASSE/MSP) (03-07/05)
- Director of the National Program for cancer control DIGESA/MSP (08/05 Present)

Other personal data

- Founding member of the Pediatric and Oncology Society of Uruguay.
- Member of multiple national (Uruguay) and international scientific societies.
- Member of several editorial committees for national and international scientific publications.
- Author of more than 200 publications.
- Work on the development and creation of several logistic plans for oncology assistance at the Institutions of Collective Medical Assistance (IAMC).
- Awards, scholarships, and multiple recognitions nationally and internationally.

Professor Dr Ignacio Miguel Musé has focused his professional life to interdisciplinary approach to the cancer problem. Throughout his academic and scientific career he has dedicated himself to community outreach programs, at an educational level as well as the organization of assistant oncology units across the country.

He created, promoted, and is the current vice-president of the Honorary board for the fight against cancer, a NGO dedicated to the education, early diagnostic, and promotion of cancer research. He is responsible for the birth and development of the Center for Information on Cancer, and Cancer awareness, and of the National Registry of Tumors. At present he is leading the National Program for cancer control from the ministry of public health that encompasses all aspects related with cancer disease, including rehabilitation and palliative care.

Chisato Nagata, M.D., Ph.D.

Professor, Department of Epidemiology & Preventive Medicine Gifu University Graduate School of Medicine Gifu, Japan

Chisato Nagata is a Professor of the Department of Epidemiology & Preventive Medicine, Gifu University Graduate School of Medicine, Japan. She was on the faculty of the Department of Public Health, Gifu University School of Medicine as an Assistant professor from 1996 to 2000 and as an Associate professor from 2000 to 2005. She received her M.D. in 1988 and her Ph.D. in 1994, both from Gifu University School of Medicine. She has conducted research on breast cancer since 1996. Her research interest focuses on breast cancer risk, particularly in relation to nutrition and hormone levels.

Isabelle Romieu, M.D., MPH, ScD

Head, Nutrition and Metabolism Section International Agency for Research on Cancer Lyon, Fance

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 a research price 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.

Alvaro L. Ronco, M.D., Ph.D.

University of Montevideo, Montevideo, Uruguay

Born in Montevideo, Uruguay in 1958.

Degree of Medical Doctor at the School of Medicine, State University of Uruguay (UDELAR) in 1986. Post-graduated courses in Radiotherapy (1986-87) and Sports Medicine (1989-91).

Short-term stays at Johns Hopkins School of Hygiene and Public Health (Baltimore, USA 1995) and the German Institute for Human Nutrition (Potsdam, Germany 2006).

Former Assistant (1988-1993) and Vice-Director (1993-2003) of the National Cancer Registry of Uruguay. Associated Professor of Cancer Epidemiology, School of Medicine, IUCLAEH, Maldonado, Uruguay (2008-present).

Epidemiologist at the Gynecologic Oncology Department, Pereira Rossell Women's Hospital, Montevideo, Uruguay (2004-present).

Author/co-author of more than 190 scientific works in cancer epidemiology, around 120 of them publications in specialized international journals.

Seven times awarded by the National Academy of Medicine of Uruguay between 1990 and 2006 for epidemiologic studies.

Since 2003 he is member of the Opinion Leaders Group of the S.I.S. (Senologic International Society, Strasbourg, France) in the field of Breast Cancer Epidemiology.

Sharon Ross, Ph.D.

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.

Dominique Stoppa-Lyonnet, Ph.D., M.D.

Head of the Genetics Department of Institut Curie-Paris Professor of Genetics, Paris Descartes University, Paris, France Participating to the INSERM Unit U830, Marc-Henri Stern team leader

Dominique is a Doctor of Medicine and former intern in the hospitals of Paris since 1982. In 1990 she specialized her MD in oncology, and received her PhD in Genetic Science at the University of Paris.

Her main field of interests are: Study of genetic predispositions to cancers, especially to breast and ovarian cancers and to retinoblastoma.

Genetic counselling - almost 1,600 consultations per year by the Genetics Department. Psychological and medical management of high-risk patients is coordinated with various Institut Curie teams.

Laboratory activity: Analysis of the *BRCA1*, *BRCA2* (predisposition to breast and ovarian cancers) and *RB1* (retinoblastoma) genes. Almost 100 molecular diagnoses are performed annually (search for germline mutations).

Various fields of research work: (1) optimization of molecular analysis (detection of large rearrangements of the *BRCA1/2* genes; (2) clinical characteristics of breast cancers related to a *BRCA1/2* mutations (prognosis, response to treatment), (3) factors modifying the tumour risk in women with a *BRCA1/2* mutation; (4) study of the risk of breast cancer in women heterozygous for an *ATM* gene mutation, (5) search for new predisposing genes. Research is conducted in collaboration with various Institut Curie or external teams.

Anna Maria Storniolo, M.D.

Medical Oncologist Hematology/Oncology Indiana University School of Medicine Indiana, USA

Dr. Storniolo is a Professor of Clinical Medicine in the Hematology/Oncology Section at the I.U. School of Medicine. She earned her medical degree at the Stanford University School of Medicine in Palo Alto, California. She then completed her Internal Medicine residency and fellowships in both Hematology and Medical Oncology at the University of Rochester School of Medicine in Rochester, N.Y.

Prior to coming to Indiana University in September 2000, she was an assistant professor of medicine at the University of California-San Diego School of Medicine. She also served in various leadership positions at Eli Lilly and Company (1992-2000), where she was responsible for the clinical development of various cancer drugs, most notably Gemzar.

In addition to treating women with all stages of breast cancer, Dr. Storniolo is director of the Catherine Peachey Breast Cancer Prevention Program. She provides individual risk assessment and counseling for women who may be at risk for developing breast cancer because of a strong family history or one of a variety of other predisposing factors. This is a comprehensive program that offers women several options for managing risk, including lifestyle changes, genetic testing, medical therapy, and prophylactic surgery.

Her research interests include helping to define the process by which a normal breast cell becomes cancerous. That work has led her and some very dedicated co-workers to found the Susan G. Komen for the Cure Tissue Bank at the Indiana University Simon Cancer Center, a biorepository of biologic specimens primarily from women who do NOT have breast cancer. These samples are a source of DNA, RNA and proteins which are invaluable in deciphering the molecular changes leading from normal breast cells to cancer. Elucidating the steps in the malignant process will lead us to finding blood markers that could be used to identify women at risk before they actually develop breast cancer, and would also allow us to develop medicines that would alter that process and prevent cancer from occurring.

Rabih S. Talhouk, Ph.D.

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 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.

Mary Beth Terry, Ph.D.

Mailman School of Public Health Columbia University, New York, USA

Mary Beth Terry, PhD, is an Associate Professor of Epidemiology at Columbia University's Mailman School of Public Health (MSPH) whose research focuses on the role of early life in altering breast cancer susceptiblity.

She is currently leading the follow-up of several large U.S. birth cohort studies, including a multiethnic New York study, to examine prenatal and early life factors for breast cancer risk. In addition to research on timing of cancer susceptibility, her research focuses on how exposures influence intermediate markers of breast cancer risk including mammographic density, and biomarkers such as DNA methylation.

Dr. Terry is PI of a National Cancer Institute R01 grant to study the association between early life factors and breast cancer and another R01 to study early life exposures and pubertal development in girls from high risk cancer families.

She is also leading a large family cohort based in New York City of high risk families to prospectively evaluate absolute and relative risk in these families. In addition to her research, Dr. Terry also teaches advanced epidemiologic methods to MSPH graduate students.

Diego A. Touya, M.D.

Assistant Professor, Department of Oncology School of Medicine University of the Republic (UDELAR) Montevideo, Uruguay

Diego A. Touya, M.D., is currently an Assistant Professor in the Department of Oncology at the University of the Republic School of Medicine in Montevideo, Uruguay. He holds a B.S. from La Mennais Institute and Santa Rita College, (Montevideo, Uruguay) and a M.D. from University of the Republic School of Medicine. (Montevideo, Uruguay)

Dr. Touya has held both medical and academic appointments. He has been Collaborator of Professor in the Biochemistry department, and Assistant Professor in the department of Oncology at the University of the Republic School of Medicine. (Montevideo, Uruguay) He has held multiple hospital appointments including: Primary Care Physician, Full Member, and multiple Staff Physician positions.

Beatrice Wiafe-Addai, M.D.

C.E.O., Peace and Love Hospital, President, Breast Care International Kumasi, Ghana

I am a breast surgeon, a consultant in breast cancer management, and the Chief Executive Officer of the Peace and Love Hospitals in Accra and Kumasi. I am also the President of Breast Care International (A Non Governmental Institution in – Ghana). These Institutions were established in 2002.

My organization and the hospital have been involved in creating awareness about breast cancer in Ghana, especially in the deprived communities. We are teaching women how to do their own breast self examination, clinical screening, diagnosis, counseling, treatment and rehabilitation of patients as far as breast cancer is concerned.

Breast cancer in Ghana is shrouded with myths and misconceptions, preventing women from seeking early medical treatment. We have so far been trying to demystify breast cancer among the population especially women and disabuse their minds of the misconceptions. We are trying to empower them with some basic knowledge, all aimed at early detection to reduce mortality and morbidity of breast cancer patients.

Since its inception, the team has screened more than 400 thousand women for breast cancer. A lot is still needed to be done in a country where most of our women live in deprived communities and are not educated, with little knowledge about several diseases including breast cancer.



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

Ademola L. Adelekan, Health Promotion and Education Department, College of Medicine, University of Ibadan, Nigeria; Adewuyi Busayo, Health Promotion and Education Department, College of Medicine, University of Ibadan, Nigeria

Background: Breast Cancer (BRCA) is the commonest malignancy in women. 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. Methodology: This is a cross sectional study. Snowball sampling technique was used to select 189 women with FH of BRCA. A semi-structured questionnaire was used to obtained data from the respondents. Knowledge of BRCA was assessed on a 17-point scale. Descriptive statistics and t-test were used to analyze the data.

Results: The mean age of the respondents was 43.4±9.2 years and 40.7% have no education. Some (42.9%) were not aware of their susceptibility to BRCA. Some (42.9%) of respondents have family members who had died of BRCA and 13.2% have family members who currently have BRCA. Respondents mean knowledge score was

8.3±2.7. Majority (97.9%) believed that BRCA is strictly disease of women and many (61.4%) believed that BRCA is

not curable even when detected early. Many (65.1%) did not know that painless lump in the breast is one of the signs of BRCA. The mean knowledge score of respondents who perceived themselves to be susceptible to BRCA and those who did not were 9.0 and 7.5 respectively.

Conclusion: Knowledge of breast cancer was low and incorrect preventive practices exits among respondents.

<u>Conclusion:</u> 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.

Determinants of Women's Participation in Community-based Breast Cancer Prevention Program or Activity: The Importance of Psychosocial Factors on Women Participation in Metropolitan Tehran –Iran

Maryam Ahmadian, Asnarulkhadi Abu Samah, Mazanah bte Muhamad, Zahid Emby, Marof Redzuan, Faculty of Human Ecology, Universiti Putra Malaysia, UPM Serdang, Selangor, Malaysia; Ali Montazeri, Iranian Institute for Health Sciences Research, Tehran, Iran

Background: Local community participation in health and wellbeing is strongly supported as a fundamental element to development. Therefore, there is a need to investigate women attendance in community-based breast cancer prevention programs. The research provides a psycho-social framework to develop and implement strategies in community participation to affect community level of influence on breast cancer prevention. Method: The study applied a quantitative approach based on the cross-sectional survey design and simple random sampling. A total of 400 women aged 35-69 years, were surveyed among female clients of four hospitals affiliated to Tehran University of Medical Sciences in Tehran, Iran. Next, a total of 86 women who participated in mammography were analyzed based on their levels of participation in any community-based breast cancer prevention program or activity to identify the most effective factors influencing the level of their participation. This study is an important start to combine individual and community participation with more attention to individual determinants that is rooted in social psychology theories. The study merged three theories such as the health belief model, the theory of reasoned action, and the social cognitive theory. This study used a Rifkin (1991) perspective which describes five levels of participation in health to study the participant (compliant) group. Results: Consistent with the model, in bivariate analysis, the higher level of participation (level 2) was significantly related to more positive belief (p<0.05), greater social influence (p<0.01) and fewer barriers (p<0.01), but self efficacy (p=0.114) was not significantly related to higher level of participation (level 2). Conclusion: The findings of this theory-driven research can help in the interventions design aimed at the

strengthening of women participation in community-based breast cancer prevention program for Iranian women.

The Influence of Socio-Economic Status and Health Care Access on the Association Between Race and Breast Cancer Survival

Tomi Akinyemiju, MSc, Department of Epidemiology, School of Public Health, University of Michigan, Ann Arbor, Michigan; Amr Soliman, PhD, Department of Epidemiology, School of Public Health, University of Michigan, Ann Arbor, Michigan; Norman J. Johnson, PhD, US Bureau of the Census, Suitland, Maryland; Sean Altekruse, PhD, Surveillance Research Program, Division of Cancer Control and Population Sciences, National Cancer Institute, Bethesda, Maryland

Breast cancer survival has improved significantly in the US in the past 10-15 years; overall 5-year survival rate in 2007 was 89%. Unfortunately, stark disparities exist in breast cancer survival in the US between racial groups. Several reasons for this disparity has been offered; including racial differences in access to and utilization of screening and treatment, risk factors that are differentially distributed by race and SES, and biological differences such as tumor aggressiveness. Several studies have attempted to parse out these risk factors, but many have suffered from lack of quality data on socio-economic status and breast cancer survival. Our study uses data from 1,796 women (1,580 whites and 216 blacks) diagnosed with breast cancer between 1973 and 2003 from 60 counties in the US. The source of the data was the Surveillance Epidemiology and End Results linked with the National Longitudinal Mortality Study data. We hypothesize that individuals living in neighborhoods with poor socio-economic status and poor access to care will have lower breast cancer survival rates. We analyzed the data using Cox Proportional Hazards models in SAS 9.2. After controlling for demographics, stage and treatment, there was no significant survival difference between blacks and whites. Hazard Ratio=1.04, p-value=0.90). Furthermore, women residing in neighborhoods with poor access to healthcare personnel had worse survival rates than those residing in neighborhoods with excellent access to healthcare personnel (Hazard Ratio=4.62, p-value=0.005). Neighborhoods with poor access to healthcare facilities appeared to have better survival rates compared with those with excellent access to healthcare facilities, however the difference was not statistically significant (Hazard Ratio=0.22, p-value:0.10). These results will hopefully inform policy debates about the impact of adequate allocation of healthcare resources to provide all women with the facilities and personnel needed to prevent, diagnose and treat breast cancer and other diseases.

Formulation Development of Micropaticulate Sugar Based Cellular Uptake & Cytotoxicity Studies of PLGA based Polymeric Particulate System Encapsulating cytotoxic drug in MCF-7.

A. Alam, Z. Iqbal, S. Talegaonkar, Department of Pharmaceutics, Faculty of Pharmacy, Jamia Hamdard (University), New-Delhi-110062; D.G. Goswami, A.K. Panda, Product Development Cell-II, National Institute of Immunology, New-Delhi-110067

<u>Purpose</u>: The objective of the present study was to evaluate the effect of Tamoxifen citrate as an anticancer drug encapsulated in PLGA microparticles (MPs) decorated with size 2-4 μm and sugars including lactose, mannitol, sucrose and sorbitol by using fluorescence activated cell sorter (FACS) technique. These were synthesized by double emulsion solvent evaporation method followed by lyophillization. The formulations were evaluated for redispersibility, particle size distribution, TEM, SEM (Fig. 2. MPs), zeta potential, residual PVA content, encapsulation efficiency, in vitro bolus release and cellular uptake.

<u>Methods:</u> Various microencapsulation methods like single/double emulsion solvent evaporation, salting out, solvent extraction, spray drying etc were evaluated for making particles with desirable size distribution. The specific microsize particles were synthesized by the single emulsion solvent evaporation method using lyophillization technique.

Results: The formulation AF1/Lactose loaded with tamoxifen exhibited better particle morphology with excellent NPs reconstitution potential as compared to microparticle showing a size range of 200-400±10nm. Formulation when subjected to emulsion stability studies resulted in no discrenable changes in physicochemical properties like crystal growth and particle size. Amongst the various formulations, AF2/Mannitol exhibited the highest encapsulation efficiency of 29.79%. Furthurmore formulation AF1/Lactose-Nps gave the highest drug release of 87.21% and also exhibited redispersibility profile when compared with other formulations (AF/2, AF/3 and AF/4). The celluar uptake analyzed by fluorescence activated cell sorter (FACS) indicated that most of the microparticles (2-4 μm) were phagocytosed in the MCF-7 cell line during the six hour (HR) of the study.

<u>Conclusion</u>: We concluded that different size and sugar based particle molecule would correspond to their cellular uptake using Fluorescent-activated cell sorter (FACS) measurements were performed for evaluating the uptake of the particles or attachment of particles in MCF-7 breast cancer cells. In this study, most of the sugar based microparticle is uptake by the cells in six hr (HR). The data revealed the importance of carbohydrate excipients in improving the redispersibility, their cellular uptake (size dependent) and stability of polymeric particles. Future aspects with this abstract: Antibody decorating has tremendous result for cellular uptake and drug release of the particulate formulation.

Comparative Paradigm: Spray Dried and lyophillized Sugar Based PLGA Polymeric Nanoparticles Encapsulating Cytotoxic Drug in Breast Cancer Cell Line

Aftab Alam, Zeenat Iqbal, Sushama Talegaonkar, Department of Pharmaceutics, Faculty of Pharmacy, Jamia Hamdard (University), New Delhi-110062; Dinesh G. Goswami, Amulya K. Panda, Product Development Cell-II, National Institute of Immunology, New Delhi-110067

<u>Purpose</u>: The objective of the present study was to evaluate the comparative effect of spray dried and lyophillized nanoparticle encapsulated cytotoxic (Tamoxifen citrate) in different sugars i.e, lactose, mannitol, sucrose, and sorbitol based PLGA polymeric systems by using flourescence assorted common cell (FACS) technique, which is used for cellular uptake studies.

<u>Methods</u>: Various microencapsulation methods like double emulsion solvent evaporation, salting out, solvent extraction, spray drying etc were evaluated for making particles with desirable size distribution. The specific nanosize particles were synthesized by the double emulsion solvent evaporation method using both of the above mentioned technique.

Results: The formulations were evaluated for redispersibility, particle size distribution, TEM, SEM, zeta potential, residual PVA content, encapsulation efficiency, in vitro bolus release and cellular uptake studies. AF1-Lactose decorated NPs exhibited best redispersibility in phosphate buffer pH 7.4 which led to better powder morphology favoring nanoparticles reconstitution with a desirable size range of 200-400±10 nm. It is furthur revealed that this formulation also gave the best release and higher degree of redispersibility using spray dried technique when compared with lyophillized. The encapsulation value and cellular uptake were highest for mannitol based PLGA nanoparticle formulation in case of spray dried. n The celluar uptake analyzed by fluorescence activated cell sorter (FACS) indicates that most of the particles are phagocytosed in the breast cancer (MCF 7) cell line mainly in the first hour (HR) of the study in spray dried as compared to six hours (HR) of the study for lyophillized method.

Conclusion: We concluded that different sugar molecule using different technique would correspond to their cellular uptake using Fluorescent-activated cell sorter (FACS) measurements were performed for evaluating the uptake of the particles or attachment of particles in MCF-7 breast cancer cells. In this study, most of the sugar based nano-particle is uptake by the cells in first 6-12 hrs study. The data revealed the importance of carbohydrate excipients in improving the redispersibility, their cellular uptake and stability of polymeric nanoparticles.

Nutrition and Prevention of Breast Cancer

Ampomah JA, Health and Social Care Foundation, Kumasi, Ghana; Atiemo V, PDF Training Institute, Kumasi, Ghana

<u>Aim of Session</u>: During the session, participants will be invited to reflect on the evidence linking dietary habits to the incidence of several types of cancer with special emphasis on the chemoprotective properties of foods that originate from plants.

<u>Content:</u> From brief presentation, multiple questions, some brief exercises and group discussions, participants will be encouraged to reflect on how a large body of epidemiologic, animal, and laboratory literature indicates that as many as 30% of all cancer cases are linked to poor dietary habits. The proportion reaches 70% for the gastrointestinal tract. Worldwide, each year approximately one million women are diagnosed with breast cancer. Breast cancer prevention by dietary means therefore relies on an individually tailored mixed diet rich in basic food and traditional manufacturing and cooking methods.

Brief Agenda of Session: Participants will be encouraged to critically determine whether; Studies have consistently linked abundant consumption of plant-based food to a substantial reduction in the risk of developing various cancers; the laboratory studies show that this chemopreventive effect is related to the high levels of numerous phytochemicals in this food; These phytochemicals interfere with several cellular processes involved in the progression of cancer and also with inflammatory processes that foster development of cancer.

Intended Audience: This session will be of interest to all those responsible for the planning, implementation, supervision and evaluating instructions for the campaign on the prevention of breast and cervical cancer.

Conclusion: Dietary factors play an important role in the high incidence of several types of cancer in Ghana.

Modification of dietary habits to include daily intake of plant-based food containing anti-cancer and anti-inflammatory phytochemicals thus represents a promising approach to preventing the development of cancer.

Knowledge, attitudes and practices towards breast cancer screening programs among Iranian rural female populations in the south coast area of the Caspian Sea

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Background: Breast cancer is a global health concern and a leading cause of death among women internationally. Screening and preventive programs are critical components in reduction of breast cancer morbidity and mortality. Methods: The cross-sectional descriptive study was conducted to investigate the state of knowledge, attitudes, and practices of breast cancer screening programs in a sample of Iranian rural female populations. Using a multistage area sampling method, a random sample of women aged from 20 to 75 years old in south coastwise of the Caspian Sea in 2008-9. Selecting a representative sample of the rural female population within 20 different rural Health-Medical Centres in Mazandaran state had the same probability to be sampled. Women agreeing to participate were given a four-page, self administered questionnaire.

Result: Of the 3,600 eligible participants surveyed, 3,044 (88.55%) completed the questionnaire. Subject mean age was 34.98±9.1 years ranging from 20 to 75 years. Of all subjects, 60% were married, 61.6% had a medium-high educational level, and 51.1% were housewives. The data analysis indicated however that most participants had fairly positive attitudes but their knowledge about breast cancer screening is low and just 0.6% of the women had acceptable knowledge. In this society, nearly fifth (21.2%) had performed regularly BSE and 19.4% did CBE. In the female population above 40 years, results had suggested 93.9% (n=849) of them didn't perform mammography in past two years.

<u>Conclusion</u>: Due to inadequate knowledge of women, providing appropriate training in various methods of breast cancer screening to women seems essential to improve knowledge and practice.

Polarity-dependent genes as targets for the prevention of breast cancer development: The example of CDS1

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Primary prevention of breast cancer will require understanding key events that allow the glandular epithelium to become cancerous. Loss of apical polarity in the breast epithelium (i.e., the redistribution of cell-cell tight junction proteins away from the apical pole of cells located against the lumen of the mammary gland) has been linked to cancer development since it primes cells to enter the cell cycle. Microarray analysis comparing apically polarized and nonapically polarized breast epithelia produced in 3-dimensional (3D) culture revealed that CDP-diacylglycerol synthase 1 (CDS1) transcription was significantly down-regulated upon apical polarity loss. Still unknown in breast biology, CDS1 codes for an enzyme that converts phosphatidic acid to CDP-diacylglycerol, the main source of phosphatidylinositol. The latter is involved in the Pi3K pathway that plays an essential role in breast cancer development. Our hypothesis is that CDS1 controls breast epithelial cell behavior and impacts breast tumor development. RT-PCR analysis in 3D culture confirmed that CDS1 transcription is influenced by apical polarity status. Furthermore, altered transcription was also measured in the normal-looking tissue showing apical polarity disruption of patients with breast cancer. Interestingly, down-regulation of CDS1 transcription was consistently observed in several breast cancer cell lines and immunohistochemistry indicated that CDS1 protein was present in cancer-free tissue sections as well as normal-looking tissue of cancer patients, whereas it was absent from high grade invasive ductal carcinoma, suggesting a progressive reduction in CDS1 transcription along breast cancer development. Bioinformatics analysis of the promoter region with the web-based genome browser from the University of California Santa Cruz revealed a putative CpG island (necessary for epigenetic regulation by DNA methylation) and binding sites for transcription factors EGR1 and SP1 that are regulated by estrogen, a major player in breast cancer development. CDS1 is an interesting target to pursue for primary breast cancer prevention research.

Pterostilbene results in autophagy and cellular differentiation in MCF 7 cells via ROS dependent pathway

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This study shows the effect of pterostilbene on intracellular neutral lipid accumulation in MCF-7 breast cancer cells. On exposing the breast cancer cells with 30 μ M pterostilbene for 72 h there was an increase in the expression of adipogenic differentiation marker c/EBP α . Further, pterostilbene also inhibited 3 β -hydroxylsterol- Δ 7-reductase, the enzyme which catalyzes the last step conversion of 7-dehydrocholesterol to cholesterol and thereby causes the intracellular accumulation of the former sterol. These results were associated with a significant increase in the oxysterol binding protein homologue and liver X receptor. Further, pterostilbene caused an increase in the expression LC3 and beclin-1, which lead to an alternative pathway of autophagy. Thus the present data shows that the long term exposure to pterostilbene causes growth arrest in MCF-7 cells which may be due to differentiation of the mammary carcinoma cells into normal epithelial cell like morphology and activation of the phenomenon of autophagy.

Enhancing anti-tumor immunity of NK cells by soy peptide lunasin for breast cancer prevention

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Cancer immunosurveillance is capable of recognizing and eliminating continuously arising, nascent transformed mutant cells. Harness anti-tumor immunity by enhancing Natural Killer (NK) cell activity has been shown to eradicate tumors. In addition, the consumption of soybean products is associated with overall reduction of breast cancer development. Among the bioactive components found in soybean, lunasin is originally identified by our collaborator Dr. Ben de Lumen for its chemopreventive property by blocking histone acetylation and inducing apoptosis preferentially in transformed cells. We have recently found that lunasin also exerts immunomodulatory effects on human NK cells, and the combination of lunasin with IL-12 has synergistic effects on increasing the expression of IFN-gamma, TNF-alpha, CCL3, GM-CSF and granzyme B as well as enhancing the tumoricidal activity of NK cells; furthermore, we observed a reduction of a number of genes: TGF-beta, TGF-beta receptor, and inhibitory killer immunoglobulin-like receptors (KIRs) including KIR3DL1 and KIR3DL2. To examine the effect of lunasin in vivo, a breast cancer xenograft model attested to its efficacy by reducing the incidence and growth of MDA-MB-231 tumors in athymic nude mice. To understand the mechanism responsible for the effects of lunasin on NK cells, Chromatin Immunoprecipitation (ChIP) assay was performed to evaluate the chromatin remodeling of target genes. We found that acetylated histone H3 is positively associated with IFNG locus while negatively associated with TGFB1 and TGFBR2 loci, which correlates with gene expression profiles in NK cells following IL-12 and lunasin stimulation. Taken together, our results suggest that lunasin peptide regulates gene expression to impact the activity of NK cells. Numerous studies consistently point towards a vital role of NK cells in the defense against breast cancer. Using a natural peptide lunasin we aim to develop preemptive strategies by enhancing antitumor immunity of NK cells for breast cancer prevention.

Application of cytokeratine-19 based reverse transcriptase polymerase chain reaction for detection of mirometastasis of breast cancer

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Breast cancer is the most common cancer in women in Sri Lanka. Development of distant metastastasis is the major cause of death of breast cancer patients. Compared to the standard histology, cytokeratin 19 (CK-19) based reverse transcriptase polymerase chain reaction (RT-PCR) is shown to have a high sensitivity for detection of micrometastasis in breast cancer.

The presence of metastases in axillary lymph nodes (ALNs) is the most powerful prognostic factor. The aim of this preliminary study was to establish and optimize a RT-PCR assay for detection of micrometastasis based on CK-19 mRNA from ALNs of primary breast cancer patients.

Breast cancer tissue samples (positive control): two primary breast cancer patients. Negative control samples: an unaffected lymph node sample from a non-breast cancer patient & peripheral blood leukocytes of two healthy volunteers. Test ALN samples: primary breast cancer patients who were undergoing axillary clearance. Total RNA was extracted from all samples using Trizol method. Complementary DNA (cDNA) was synthesised from all RNA samples. cDNA were used to establish the RT-PCR using primers for CK-19 and β -actin. PCR amplicons were run on 1% agarose gel and visualized under UV transilluminator and gave 460 bp and 154 bp fragments respectively.

The 2 positive control samples showed strong PCR amplification for CK-19 marker with a 460 bp fragment. None of the 3 negative controls were amplified by CK-19. All controls were amplified by β -actin primers indicating the presence of RNA in these samples. Of the two test histopathology negative ALNs assessed, one ALN gave a CK-19 band by RT–PCR and the other was negative for RT-PCR.

This preliminary study shows that CK-19 based RT–PCR assay can be successfully applied for detection of micrometastasis of breast cancer and indicate that it could be used to compare the sensitivity of histopathology and RT-PCR in a large-scale study in Sri Lanka. The RT-PCR methodology may be further improved with the use of multimarkers and sentinel lymph node samples to increase sensitivity.

Associations of telomere length with serum biomarkers, nutrient intake, and anthropometric measurements in 438 postmenopausal overweight sedentary women

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Background: Overweight/obesity and a sedentary lifestyle increase risk for several types of cancer, and are associated with dysregulation of glucose and insulin, adipokines such as leptin, and sex steroid hormones. Telomeric regions comprise the molecular caps of chromosomes, which shorten by ~50-100 base pairs with successive cell division. Histone modifications and DNA methylation at telomeric regions play a central role in regulating telomere length. Recent epidemiologic studies reported an association between telomere shortening in peripheral blood cells and increased risk of several cancers. Observational data suggest that overweight/obesity are associated with telomere shortening.

Methods: We investigated the assocation between telomere length (TL) in 438 postmenopausal, overweight/obese, sedentary women, 50-75 years, who were participants in the 4-arm randomized-controlled Nutrition and Exercise in Women study, a year-long study on the effects of exercise and/or dietary weight-loss on circulating hormones and other outcomes. At baseline, women answered questionnaires including a Food Frequency Questionnaire (calculated variables include total caloric intake, grams/day of carbohydrate, protein, fat, fiber); and body composition and anthropometric measurements were taken (weight, height, % bodyfat (DEXA)). TL was measured by quantitative-PCR from DNA isolated from peripheral-blood leukocytes. Biomarkers (insulin, glucose, sex-steroid hormones, leptin, adiponectin, C-reactive protein, SAA, interleukin-6, insulin-like growth factor-1, insulin-like growth factor binding protein-3, Vitamin D) were analyzed from fasting baseline serum. Partial Pearson correlation coefficients, adjusted for age, were obtained to represent associations between TL and continuous covariates; and ANOVA to estimate differences in TL between dichotomous variables.

Results: TL was inversely associated with age (r=-0.13, P=0.01), and serum glucose levels (r=-0.10 P=0.03), with telomeres significantly longer in women with low glucose levels (below the mean) compared to high (P=0.02).

The anti-proliferative effects of the conjugated linoleic acid isomer trans9, trans11 on MCF-7 breast cancer cells are associated with LXR activation

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Liver X Receptors (LXRs) are oxysterols-activated transcriptional factors that belong to the nuclear receptor superfamily and play a key role in the regulation of the lipid homeostasis at the transcriptional level. Some of LXR target genes are involved in the cholesterol efflux, among them, the ATP binding cassette (ABC) transporters ABCA1 and ABCG1, and the ADP-ribosylation factor like-7 (ARL7) which is involved in the movement of intracellular cholesterol to the membrane for ABC associated efflux. LXR agonists have been shown to inhibit proliferation and induce apoptosis of prostate, breast and ovarian cancer cells.

Conjugated linoleic acids (CLA), which are positional and geometric isomers of linoleic acid found in dairy products and meat from ruminants, have been widely reported to possess anti-tumoral activity against breast cancer both in vitro and in vivo. However, most studies have used mixtures of isomers and the individual role of these different isomers has been poorly evaluated. Moreover, recent data showed that some CLA isomers regulate LXR target genes and are proposed as novel LXR agonists.

<u>The aim:</u> of our study is to evaluate the individual anti-proliferative effect of three different CLA isomers (c9,t11-CLA, t9,t11-CLA and t10,c12-CLA) on MCF-7 breast cancer cells, and to check the hypothesis that these effects are associated with LXR activation.

<u>Results:</u> of MTT assays, and those of cell death quantification, showed that the isomer t9,t11-CLA decreased the proliferation of MCF-7 cells by 50%, and induced a significant increase in dead cells after 24 hours of treatment. This isomer was more efficient than the two other fatty acids tested. Moreover, t9,t11-CLA induced the expression of the pro-apoptotic genes BAX and p53, as well as LXR target genes ABCG1 and ARL7, while it decreased the expression of the anti-apoptotic gene Bcl-2.

<u>It is hypothesized:</u> that LXR activation through CLA isomers could lead to membrane cell deprivation by stimulating cholesterol efflux. This could down regulate cell proliferation and stimulate apoptosis. Animal models would be necessary to confirm the interest of a nutritional approach in vivo using these compounds.

A large body shape early in life is associated with a decreased risk of ER+/PR+ breast cancer risk at adulthood

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<u>Background:</u> A large body shape in early life has already been related to a decreased breast cancer risk in the French E3N cohort and in previous studies, but no information was available on the hormonal receptor status of the tumor.

Material & Methods: The influence of body shape over the life course (at age 8, at menarche, at 20-25, at 35-40 and at baseline) on breast cancer risk was evaluated with the Sörensen's silhouettes, among 81,089 women from the French E3N cohort. Multivariate Cox models were performed to estimate hazard ratios and their 95% confidence intervals. Analyses were stratified by menopausal status and hormone receptor status.

Results: A total of 3573 breast cancer cases were diagnosed during the 1990-2008 follow-up period. A significant trend of decreasing risk of breast cancer with increasing silhouette was observed both at age 8 and at menarche (with significant HRs for the largest silhouette as compared to the thinnest used as the reference at age 8 and at menarche). Results were similar in the pre- and postmenopausal breast cancer subgroups. When hormone receptor status of the tumor was considered, the decrease in risk was mostly observed in the ER+/PR+ subgroup. No significant association was found between silhouette at 20-25 and 35-40 and breast cancer risk, whatever the menopausal status or the hormone receptor status of the tumor. Additional adjustment for BMI at adulthood did not alter any of the observed associations. A large silhouette at baseline was associated with a significant increased risk of postmenopausal ER+/PR+ breast cancer.

<u>Conclusion</u>: A large silhouette early in life was associated with a decreased breast cancer risk at adulthood, preferably of ER+/PR+ status. Since a large body shape is also related to an earlier menarche, an established breast cancer risk factor, such women should experience an increase in risk. This paradoxical result should encourage further investigations.

Anti-carcinogenic effects of Morinda Citrofolia

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One in every four women in the world who has cancer will have breast cancer. It is predicted that one in every eight women in the United States will be diagnosed with breast cancer in her lifetime, making breast cancer the second most prevalent cancer in the nation. An increase in the use of complementary and alternative medicine (CAM), specifically by breast cancer patients prompted us to study the anti-cancer effects of Polynesian traditional fruit, Morinda citritfolia (noni). Estrogen receptor (ER) positive breast cancer cells, MCF-7 were initially treated with fermented noni juice (fNJ) at varying concentrations for up to 96h. 15% fNJ demonstrated cell death in 50-60% of the cells. Preliminary mechanistic studies suggest effects of fNJ on tumor necrosis factor related apoptosis ligand (TRAIL) and survivin, involved in regulating apoptosis. Future studies will be targeted to identify the apoptosis signaling mechanism activated by fNJ. [Grants: USDA-CREES (2004-34135-15182), NCCAM (R21AT003719)]

Knowledge, attitudes and practices towards breast cancer screening programs among Iranian urban female populations in the south coast area of the Caspian Sea

Simin Joharinia, Hassan Khani, Mohammad Reza Majdi, Sareh Basirat, Iranian Applied Research Center for Public Health and Sustainable Development (IRCPHD), North Khorasan University of Medical Sciences; Ali Montazeri, Iranian Institute for Health Sciences Research, Tehran

Background: Breast cancer is a global health concern and a leading cause of death among women internationally. Screening and preventive programs are critical components in reduction of breast cancer morbidity and mortality. Methods & Materials: The cross-sectional descriptive study was conducted to investigate the state of knowledge, attitudes, and practices of breast cancer screening programs in a sample of Iranian urban female populations. Using a multistage area sampling method, a random sample of women aged from 20 to 75 years old in south coastwise of the Caspian Sea in 2008-9. Selecting a representative sample of the urban female population within 20 different urban Health-Medical Centres in Mazandaran state had the same probability to be sampled. Women agreeing to participate were given a four-page, self administered questionnaire.

Results: From 3,600 participants 2,846 (79.05%) women complete the questioners. Subject mean age was 30.21±9.7 years with range of 20 to 75 years. Of all subjects, 65.6% were married, 48.6% were housewives, and 69.2% had medium-high education. Knowledge about breast cancer prevention was 10.6% acceptable, 69.6% middle, 19.7% low and 0.1% unacceptable in the study population. The correct answers ranged from 12.9% to about 65.1%. Most participants had fairly positive attitudes about breast cancer screening. 58.2% of the women did not performed breast self-examination monthly in the past year. Approximately 78.7% did not undergo a specialist visit once in past two years. In the women 40 years and older, results had suggested 51.6% (n = 263) didn't mammography in past two years.

<u>Conclusion:</u> Due to inadequate knowledge of women, providing appropriate training in various methods of breast cancer screening to women seems essential to improve knowledge and practice.

Breast Cancer in History

Abdul Nasser Kaadan, University of Aleppo

In 1600 BCE the old Egyptians blamed cancer on the Gods. Ancient Egyptian scrolls described eight cases of breast tumors treated by cauterization. Hippocrates (460-370 BCE) was the first who recognized differences between benign and malignant tumors of the breast. In China the first clinical picture of breast cancer was described in The Nei Ching in 250 BCE. In Italy, Galen (129-216 AD) removed some tumors from the breast surgically, and believed that cancer was better to left untreated. In the 17th century, Netherland Dutch surgeon Adrian Helvetius was the first who performed both lumpectomy and mastectomy, claiming this cured breast cancer. Wilhelm Fabricius Hildanus (1560-1634) removed enlarged lymph nodes in breast cancer operations, while Johann Scultetus (1595-1645) performed total mastectomy. In 1890s in USA, Prof. William Stewart developed the radical mastectomy for breast cancer, and during the 1930s-1950s a classification of breast cancer was introduced. In the 1960s-1970s, trials in several countries demonstrated the effectiveness of mammography screening for breast cancer. The aim of this paper is to shed light on the different stages of breast cancer in History.

Development of a cloned BRCA1 knockout pig model

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Inherited breast cancer is commonly caused by loss-of-function mutations in breast cancer susceptibility genes, such as BRCA1/BRCA2. We have been working on generating a pig model of breast cancer with regard to genetics, anatomy, physiology and metabolism similarities between pigs and human. Using recombinant adeno-associated virus-mediated gene knockout and handmade cloning by somatic cell nuclear transfer, we have generated a pig model (female, Yucatan minipig) with a deletion of 55 bp in exon 11 of the BRCA1 gene. In one of our previous studies, we transferred 347 cloned embryos into three recipient sows and successfully produced 7 BRCA1 knockout (BRCA1+/-) piglets (Transgenic research, 2010). However, all BRCA1+/- pigs died within 18 days after birth. One possible cause of the death in these pigs could be resulting from a combination of BRCA1 haploinsufficiency and insufficient epigenetic reprogramming. We then used a re-cloning strategy, in which newborn fibroblasts from the cloned BRCA1+/- pigs were used as nuclear donor cells for a second-round cloning, in order to generate a viable BRCA1^{+/-} pig. 291 cloned embryos were transferred into three recipient sows. All recipient sows were pregnant, however, two sows aborted and one sow gave birth to 8 BRCA1^{+/-} piglets (6/2, stillborn / liveborn). One of the liveborn piglets died 3 days after birth but the other piglet is now weaned and growing to maturity. This BRCA1^{+/-} piglet will serve as a founder pig for generating more BRCA1+/- pigs to investigate the pathogenesis of BRCA1associated breast cancer. In another cloning effort, of which mix of BRCA1*/c cell clones were used as nuclear donor cell, 15 (1/14, stillborn / liveborn) Yucatan BRCA1^{+/-} piglets have just been born (29/07/2011) and we are also working on generating BRCA1^{+/-} Göttingen minipigs. We hope that these BRCA1^{+/-} minipigs will serve as an alternative preclinical animal model for breast cancer research and prevention.

Effect of an educational program on knowledge, attitudes and practices towards breast cancer in women from rural communities of the Ashanti region in Ghana

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<u>Background</u>: Breast cancer is an increasing public health problem in developing countries. One of the main issues is the late detection of the disease. In Ghana only about 30% of the cases are detected at early stages. Breast Care International (BCI) is a Ghanaian NGO dedicated to develop breast cancer awareness. A cross-sectional survey was designed to assess the effect of the BCI programs on knowledge, attitudes and practices (KAPs) towards breast cancer among women from rural communities of Ghana.

<u>Methods</u>: 232 women from two communities of the Ashanti region were recruited in June 2011 using interviewer-administered questionnaires designed to assess the KAPs of the participants towards breast cancer. 131 participants were members of a community having previously received the BCI program (intervention group) and 101 of another community which received the program two days after the survey (referent group). Data analysis was performed using Epi-Info software version 3.5.1.

Results: The knowledge of breast cancer among participants having received BCI program was better. Mean knowledge score was 53.7% for the referent group and 65.3% for the intervention group. Only 54 participants from referent group (53.5%) knew that breast cancer usually presents as a painless breast lump as compared to 107 participants from intervention group (82.3%). Both groups had poor knowledge about risk factors; Only 31 participants (23.8%) from intervention group and 9 (9%) from referent group knew that breast cancer can be inherited. Participants having attended the program were 12.4 times more likely to practice BSE (Odds ratio [OR] = 12.37, 95% Confidence interval [CI] = 6.45 - 23.69).

<u>Conclusion:</u> BCI program has a positive impact on KAPs towards breast cancer. Nevertheless some results leave room for improvement of the existing program. We recommend to emphasize education about risk factors and to expand the program curriculum towards community health workers education.

Survival Rate of Breast Cancer Based on Geographical Variation in Iran, a National Study

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<u>Introduction</u>: Breast cancer is the most common cancer among women worldwide. Based on the latest Iranian report, the total number of women registered with breast cancer was 6976 cases during 2007. Five year survival is one of the indicators used for evaluation of the quality for care to different types of malignancies including breast cancer. The aim of this study was to estimate survival rate of breast cancer in 6147 Iranian patients at a national level in different geographic regions.

<u>Methods:</u> 6147 cases of breast cancer which had telephone number and were diagnosed between 2001 - 2006 were called to obtain information about their life status. Survival estimates were calculated using the Kaplan-Meier method, and the survival probability was calculated for the overall cohort and in different categories ofgender, age and pathologic type of tumor. Hazard ratios (HR) according to demographic and risk variables were calculated by Cox's proportional hazard model.

Results: The overall 5-year survival rate was 71.0%. The mean survival time was different between men and women which was statistically significant. The number of men involved with breast cancer was 172 (2.8%) of all cases. The 5-year survival rate for patients in age group 41-50 years was significantly higher than other age groups (p = 0.001). The likelihood of death was higher in patients with 61 years old or more years rather than those below forty years old ((HR = 1.31; 95% CI: 1.12-1.55).

<u>Conclusion</u>: The findings of this study might help Iranian health managers: 1) to understand ethnical and geographical determinants of breast cancer as socioeconomic factors might affect the cancer survival. 2) To carry preventive activities such as public education particularly in Iranian men. 3) To think about screening and early detection of breast cancer.

Change in Primary Health Care Practices: A Way to Increase Breast Cancer Screening in Ghana Ringo Obeng, Health and social Care Foundation; Samuel George Atiemo, Premier Pre University

<u>Context</u>: Screening tests for breast cancer patients in Ghana remain underutilized despite their proven effectiveness in reducing morbidity and mortality among women. The policy implications are immense for long term care and demands on public expenditure and families.

<u>Settings:</u> Breast cancer screening is most likely to improve when a health organization supports performance through organizational changes in primary health care practices and procedures. In other words organizational changes in the staff and procedures applied increases the breast cancer screening rate.

<u>Objectives:</u> Participants to reflect on organizational interventions that increases the screening rate of breast cancer patients. To examine critically the effects of the change in primary health practices on the screening rate.

<u>Main Outcomes:</u> The results show that an outcome of measure was determined by the change in the proportion of eligible individuals receiving cancer screening services between intervention and control practices. Significant different in the breast cancer screening rate was apparent. Organizational change as a factor of differential screening rate explained the variation in breast cancer prevention. A lack of clinics devoted for prevention, use of planned care visits, continuous quality control interventions and designation of non physician staff for specific prevention activities played large roles in explaining breast cancer screening rates.

<u>Conclusions:</u> To increase breast cancer screening goals, organizational change interventions should be implemented tailored to the primary health care practice style. Interventions that circumvent the physicians were more effective. We could not conclude whether or not continuous quality performance was effective. Further research is needed to evaluate the cost effectiveness of these interventions.

Chemoprevention of Breast Carcinogenesis by Spirulina

Allal Ouhtit, Sultan Qaboos University

Spirulina platensis (SP) is a filamentous cyanobacterium microalgae with potent dietary phyto-antioxidant and anticancerous properties. We investigated the chemopreventive effect of SP against DMBA-induced rat breast carcinogenesis, and further characterized its underlying mechanisms of action in vitro. Here, we provide, for the first time, in vivo evidence of chemotherapeutic effect of SP against DMBA induced mammary carcinogenesis in rats, which was clearly demonstrated by morphological and histological studies. Spirulina supplementation reduced the incidence of breast tumors by 80%. At molecular level, the proliferation marker, Ki-67 and estrogen receptor was higher in the mammary glands of DMBA-induced rats. Sp increased mutant p53 in MDA-MB-231 cell line, followed by an increase in Bax/bcl-2 ratio turning the course of cellular events into increased apoptosis and inhibition of cell proliferation. This is the first report of in vivo chemopreventive effect of SP against DMBA-induced rat breast carcinogenesis, supporting its potential use in chemoprevention of breast cancer.

Survivin, A Novel Target of CD44-Promoted Breast Tumor Invasion

Allal Ouhtit, Sultan Qaboos University

The hyaluronan (HA) receptor CD44 plays an essential role in cell-cell or cell-extra cellular matrix communications and is a bioactive signal transmitter. Although a number of studies have described the function of CD44 in breast cancer (BC) metastasis, the underlying mechanisms are yet to be determined. Using a validated tetracycline (Tet)-Off-regulated CD44 expression system in the MCF7 cell line combined with microarray analysis we identified survivin (SVV) as a potential downstream transcriptional target of CD44. To test the hypothesis that SVV underpins CD44-promoted BC cell invasion, we combined molecular and pharmacological approaches and demonstrated that CD44 induction increased SVV expression levels, which in turn promotes BC cell invasion. Further, Clinical analysis of breast tissue samples showed that SVV expression patterns paralleled those of CD44s during breast tumor progression. More interestingly, we identified PI3K/E2F1 pathway as a molecular link between HA/CD44 activation and SVV transcription. In addition to identifying SVV as a target for HA/CD44-signaling, this investigation provides a better understanding of the molecular mechanisms that underpin the novel function of SVV in breast cancer metastasis.

Nutritional factors in breast cancer: first report from Iran

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Introduction: Breast cancer is one of the main causes of cancer fatality in women. Among Iranian females, it is the most common cancer which tends to affect younger ones. Nutritional role such lipid consumption or limitation in daily diet are valuable in evaluation the clinical course, prognosis factors. However their nutritional role in Iranian women has not been explained completely. The correlation of mentioned factors with survival of breast cancer has been assessed in this study.

<u>Materials and Methods:</u> lipid, carbohydrates, vitamins and minerals consumption in 400 breast cancer patients diagnosed between 2008- 2009 was done. All cases were matched with similar cases in control group and result was analyzed.

<u>Results:</u> Of the 400 studied patients,53/2%,48/9% and 54/1% were meaningful difference for lipid, vitamins and minerals consumption with control group. (p=0/004 for lipids, p=0/02 for vitamins and p=/001 for minerals). in data analysis detected no correlation between carbohydrates consumption and breast cancer.

<u>Conclusion</u>: The presented pattern of nutritional role of lipids, carbohydrates, vitamins and minerals consumption is explained partly by demographic factors. Since no similar study has been conducted in this region, larger studies in basis of demographic variables are suggested.

Diabetes, Overweight and Risk of Postmenopausal Breast Cancer: A Case- Control study in Uruguay

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Obese postmenopausal women increase their risk of developing breast cancer (BC), in particular if they display an android-type pattern of adiposity, which is also associated to increased risks of diabetes mellitus, hypertension and cardiovascular disease. In order to explore the associations among anthropometry (body mass index [IMC], body composition, somatotype), some specific items of medical history (diabetes, hypertension, dyslipidemias, hyperuricemia) and the risk of BC in Uruguayan women, a case-control study was carried out between 2005-2009 at our Oncology Unit. 912 women of ages between 23-69 years (367 new BC cases and 545 non hospitalized, agematched controls with a normal mammography) were interviewed. Twenty body measurements were taken in order to calculate body composition and somatotype. Patients were queried on socio-demographics, reproductive history, family history of cancer, a brief food frequency questionnaire and on personal history of diabetes, dislypidemias, hyperuricemia, hypertension and gallbladder stones. Uni- and multivariate analyses were done, generating odds ratios (ORs) as an expression of relative risks. A personal history of diabetes was borderline, positively associated to BC risk (OR=1.64), being higher and significant among postmenopausal women. Diabetes was also significantly associated in overweight postmenopausal women with strong endomorphism. The risk of BC in postmenopausal women with overweight/obesity, dislypidemia, hypertension and diabetes compared to those postmenopausal ones being normoweight and without any history of dislypidemia, hypertension nor diabetes was significantly high (OR=19.1). A personal history of diabetes was strongly associated to BC and overweight. The studied sample had a subset of high-risk of BC featured by postmenopausal overweight and diabetic women, who also had a personal history of hypertension and/or dyslipidemia. The present results could contribute to define new high risk groups and individuals for primary as well as for secondary prevention, since this pattern linked to the metabolic syndrome is usually not considered for BC prevention.

The Breast Cancer Risk Profile Report: Pilot Phase of a Personalized Preventive Tool

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Although breast cancer (BC) is a polygenic and multifactorial disease, the idea of a primary prevention based on selected modifiable factors does not seem to be very feasible in the close future. Recognizing the difficulty for achieving universal nutritional and lifestyle guidelines, attempts of individual prevention which take profit of local and international data are needed. In order to give personalized preventive recommendations, on a basis of country-specific research findings and putative risk and protective factors which are mostly modifiable, we developed an individual risk profile report whose practical application is oriented to lower the womans risk level of BC. Data are requested through a thorough questionnaire on sociodemographics, family history of cancers, reproductive history, diet, lifestyle and occupation, completed with a detailed anthropometric assessment, which allows calculating body composition and somatotype. Additional information is obtained from selected laboratory tests, as serum vitamin D, urine 2:16 ±-hydroxyestrogens ratio, serum triglycerides/HDL ratio, C-reactive protein and others. A series of 20 items is taken into account to compose a tailored risk profile, which enables us to give the patient a number of useful guidelines. Patients should undergo a follow-up during at least one year, with the aim of checking whether the expected changes are having place or not. The hormonal, metabolic and immune basis on which BC is supported may be modified through simultaneous actions at different levels. Although generalizability of the proposal is limited due to features of Uruguayan women, the strategy is feasible from a practical viewpoint, taking into account the necessary resources for its application. From a medical and ethical viewpoint, it is justified to recommend certain nutritional changes to women, because no adverse side effects are expected to occur.

Interrelationships between Body Composition and Somatotype and the Risk of Breast Cancer

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We have recently studied associations between anthropometry and risk of breast cancer (BC), by application of original techniques, as somatotype [Braz J Epidemiol 2008;11(2): 215-27] and body composition [Nutr Cancer 2009;61(4):466-74].

<u>Objectives</u>: In order to analyze possible interrelationships among findings derived from those methods and BC, we carried out between 2004 and 2008 an epidemiologic case-control study at the Uruguayan hospital which is a local reference on breast diseases.

<u>Material and methods:</u> The study included 437 newly diagnosed cases of BC and 1110 population controls with a normal mammography, who were frequency-matched by age of cases ± 5 years.

Results: After adjusting for age, residence, selected reproductive variables, family history of BC, selected food intakes and body mass index, multivariate analyses revealed an increase of risk for the highest quartiles of fat weight (OR=4.57, 95%CI [2.97-7.02]), fat fraction (OR=3.43, [2.41-4.88]), endomorphy (OR=5.45, [3.33-8.93]) and ectomorphy (OR=1.81, [0.99-3.30]). Further analyses including all quoted terms and involving mutual adjustments found significant changes mostly as an attenuation for fat weight (OR=3.17 [1.82-5.53]), fat fraction (OR=2.73 [1.82-4.10]) and endomorphy (OR=3.27 [1.71-6.25]), but on the contrary, ectomorphy increased its estimates (OR=3.30 [1.71-6.38]). Muscle weight and fraction were significantly negatively associated, but they experienced no change after adjusting for endomorphy and ectomorphy.

<u>Conclusions:</u> Since increases of risk were found in women with high adipose amount and fraction as well as with slender or round body type, results suggest that fraction and amount of fat component as well as their distribution might be independent risk factors for BC in the studied population.

Evaluation the effect of rectal diclofenac in comparison with morphine in post operational breast lump excision, a prospective double blind study

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Excision of breast lumps whether in therapeutic or diagnostic orders is very common in clinics. The post operative pain and its management could highly influence the quality of services provided. In a prospective double blind study we aimed to compare the analgesic effect of morphine as an opioid with diclofenac as an non-steroid anti-inflammatory drug. Sixty four patients who underwent partial excisional processes were randomly divided into two equal groups. Diclofenac was administered in three doses of 50 mg rectally and the other group received 2mg of intravenous morphine x3. A nurse who did not know about the patients regimen asked them about their post operation pain intensity exactly after the operation, 6hrs, 12 hrs, and 24hrs after. The answers were collected in a pain scaling manner regarding self-report of pain intensity from 1 to 10, regarding 1 to 4 as mild, 5-7 as moderate, and 7-10 as severe. There was no significant difference in the pain intensity of two groups right after the surgery and 24 hrs after. The group treated with diclofenac had significantly lower level of pain 6 and 12 hrs after the operation (P=0.012 and P=0.018 respectively), There was no difference in the nausea and tiredness of two groups as well as bleeding volume. The usage of rectal diclofenac in the NPO phase of post operation all breast lump excision could be as efficient as opioids and could even have better results in pain relief without causing dependence in patients.

Do Green Tea Polyphenols Prevent Breast Cancer?

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Green tea polyphenols (GTPs) have anticarcinogenic effects against breast cancer in experimental studies. However, epidemiologic evidence that GTPs prevent breast cancer has been inconsistent. We conducted several observational studies and one RCT since 2004 to evaluate effects of GTPs on breast cancer in incidence, genetic polymorphisms, hormones, and breast density.

Two hospital-based case-control studies have completed in 2004-2005 and 2008-2009. The studies were conducted in southeast and northeast China with the same design. We recruited 1009 incidence cases with histopathologically confirmed breast cancer and randomly selected 1009 age-matched healthy women from outpatients in breast clinics as controls. While 643 breast cancer cases and 590 controls were recruited in northeast China. Tea consumption, diet and lifestyles were collected by face-to-face interviewers using a validated questionnaire. Risks of breast cancer were assessed by adjusted odds ratios (ORs) and associated 95% confidence intervals (CIs) based on multivariate logistic regression analysis.

Green tea consumption was consistently associated with a reduced risk of breast cancer observed in our studies. Compared with never or seldom tea drinkers, the adjusted ORs were 0.86 (0-72-1.02) in women consuming 1-249g of dried green tea leaves per annum; 0.68 (0.54-0.86) for 250-499g; 0.57 (0.44-0.75) for 500-749g; and 0.60 (0.47-0.77) for 750g per annum; with a significant test for trend (p=750g of dried tea leaves annual and >=1 cup of tea daily respectively.

We conclude that regular consumption of green tea can protect against breast cancer. Current processed studies will provide a knowledge platform from which to launch a large-scale breast cancer prevention trial of GTPs.

Green Tea Polyphenols and Serum Hormone Level: Preliminary results from a Placebo-Controlled RCT in Premenopausal Women

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Green tea polyphenols (GTPs), especially the catechin, (-)-epigallocatechin gallate (EGCG), have been reported to reduce blood levels of testosterone, estradiol, and luteinizing hormone in animal studies. Green tea intake was inversely correlated with estradiol reported in Japanese women. There is no evidence available in acute effects of GTPs on serum sex hormones in human. We conduct a clinical trial in 200 females to test whether GTPs modify circulating levels of sex steroid and peptide hormones. It was a two-arm, parallel-group, randomised, variably blocked, placebo-controlled, double-blind intervention using encapsulated GTPs 450mg or placebo 3 times per day for 24 weeks. Since June 2009, 181 pre-menopausal women who remained healthy were recruited at the breast clinics of Zhejiang University Women's Hospital in southeast China. Blood samples were obtained before and after intervention from each woman on Day 5 of her menstrual cycle. Serum concentrations of luteinizing hormone (LH), follicle-stimulating hormone (FSH), prolactin (PRL), estradiol (E2), progesterone (P), and testosterone (T) were measured. At the stage of the trial, 30 women aged 31-51 years (mean 39.1±5.0) have completed intervention. We report preliminary results from the study. Compared to controls, there was no difference in serum level of hormones measured at baseline and post-intervention. Compared serum hormone level before and after intervention using paired t-tests, there was no difference in LH, FSH, T, E2, P, and PRL in both test and control groups. A marginally significant difference in PRL serum concentration after intervention was found between test and control groups (P= 0.04). However, it may be due to a chance, giving few women who completed their interventions. This ongoing trial could provide evidence whether GTPs have acute effects on serum sex hormones in pre-menopausal Chinese women.



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