Prospective study of the energy balance disruption during adjuvant chemotherapy in post-menopausal early-stage breast cancer patient

Emilie E. Gadéa, Marie Viala, Mohun R.K. Bahadoor, Emilie Thivat, Pascale Dubray Longeras, Isabelle van Praagh, Marie-Ange Mouret-Reynier, Martine M. Duclos, Béatrice Morio, Xavier Durando

3rd International Conference of

The International Association of Medical and Biomedical Researchers

Cancer – Present and Future Perspective

ABSTRACT BOOK

September 16 – 18, 2013

SSR Medical College, Mauritius

ABSTRACT BOOK

International Conference on

Cancer –

Present and Future Perspective

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Organized by

SSR Medical College, Mauritius

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International Association of Medical and Biomedical Researchers | IAMBR

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About IAMBR

The International Association of Medical and Biomedical Researchers (IAMBR) was founded in December 2010 with the objectives to motivate and sensitize people from medical and related backgrounds to participate in medical and biomedical research through interactive scientific meetings. The prime mover (who is regarded as founder) was *Arun Kumar Agnihotri*, a Professor of Forensic Medicine at SSR Medical College following a suggestion by Sushil Dawka, a Professor of Surgery at SSR Medical College and Theeshan Bahorun, a Professor of the Department of Biosciences at the University of Mauritius, who are also considered to be founding members. The first meeting was held at SSR Medical College, Mauritius under the chairmanship of the Principal, Professor (Mrs.) S. Shukla on Tuesday 10 December 2010 to appoint the first board members of the association, notably:

- Prof. Nilima Jeebun – President
- Prof. Theeshan Bahorun – Vice-president
- Prof. Arun Kumar Agnihotri – Secretary
- Prof. Sushil Dawka – Asst. Secretary
- Prof. A P Singh – Treasurer
- Prof. Smriti Agnihotri – Asst. Treasurer
- Prof. Rimli Barthakur – Member
- Dr. Sudesh Kumar Gungadin – Member
- Dr. Namrata Chhabra – Member
- Dr. Vandna Jowaheer - Member

The IAMBR is an international organization and multidisciplinary in nature including members from basic sciences and clinical medical faculty as well as the members from allied sciences. The Association (IAMBR) was registered on February 16, 2011.

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About SSR Medical College

SSR Medical College, Mauritius prides itself in offering an intimate, collegial environment, which fosters human values and genuine learning. The school offers the best education in an environment that supports the practice of new skills as well as an individual student's capacity to learn and serve. A unique emphasis on understanding and discipline in every action is the focal point, and this nurtures the student's intellectual and personal growth. Progressing with a noble idea to transform education from being a cluster of well-understood subjects to becoming well-adapted aspects and principles of life, SSR Medical College has become a "CENTRE OF EXCELLENCE" in medical education, medicare, training and research.

Mr. R P N Singh, an educationist and social planner from India is the Founder Chairman and Managing Trustee of the Trust (IOMITs). The college strives to excel in every aspect of education under the direct guidance of honorable chairman whose vision has made every success possible.

Message

Following the more than decade old tradition of coming out with a Health Booklet on the occasion of our Annual Day for community awareness,we are coming out with this health awareness booklet on "Cancer". For the last 2 years, the SSR Medical College is also sponsoring an International Symposium on the occassion, under the aegis of IAMBR, an association platform started by the faculty members of the SSR Medical College to keep them abreast, informed and in communication with the eminent International scholars of the medical field.

Whereas, I leave it to the Eminent scholars from 4 continents and 7 countries present in our Symposium to address the analytical and therapeutic aspect of such a dreaded disease like cancer; I cannot help but expressing the concern towards the cancerous degeneration and degradation in the moral fibre of socio-political life; especially in the life of those who are entrusted by the people to lead the society and whose decisions make or mar the societies.

Thankfully, with the advent and effective positive use of social mass media, the public figures are not in a position to avoid public glare and scrutiny for much long. However, the time has come when the intellectual world shall not confine itself, only to their respective fields. I hope, and I am sure that our intellectual world would step out and would rise to the occasion and take cognisance of the social cancers also; which would raise them from the confines of their labs to the great world of "The Scientist as Rebels" like Haldane and Einstein, who said,'ethical progress is the only cure for the damage done by scientific progress, in the coming 3 new ages of Information, Bio and Neurotechnology; as the widening gap between Science, Technology and Human needs can only be filled by Ethics'. –

Happy Research and Best Wishes- R.P.N.Singh

Shri. R P N Singh
Chairman,
SSR Medical College, Mauritius
Patron

Message

The International Association of Medical and Biomedical Researchers is organizing its third International Conference on “Cancer- Present and Future Perspective” on September 16th - 18th, 2013 at SSR Medical College, Mauritius.

With the experience earned from our first national symposium on 'Microbial Resistance to Antibiotics' in 2011 and our second venture, an international symposium on "Diabetes- the way forward" last year, and motivated by the appreciation, encouragement and support of well-wishers, the IAMBR has decided to hold this conference on an international scale.

Our panel of invited speakers includes national and international authorities whose expertise and erudition span the spectrum of oncology research from the molecular through the clinical to the epidemiological aspects. The interdisciplinary discussions that result from this unique representation of cutting edge research will deliberate upon every advance and stratagem in mankind’s battle against Cancer. This conference will help redraw the 21st century battle-lines, and give us a frontline perspective on (in the words of a 19th century surgeon) ‘the emperor of all maladies, the king of terrors’.

A conference of this scale would not be possible without the unstinting support, advice and encouragement of our Chairman, and on behalf of the association I express our heartfelt gratitude. Our Principal too merits our thanks for her inspirational inputs and facilitation.

Our invited speakers have worked around their professional commitments to visit our corner of the world and share with us their knowledge and ideas, their experience and their viewpoints, and it is they who will shape the intellectual outcome of this conference. We are grateful for their sacrifice and effort, and we extend to them a warm welcome.

We also welcome all the delegates as well as the faculty, staff and students of SSR Medical College and gratefully acknowledge their participation and contribution.

Finally, I would like to thank the Organizing Committee and the IAMBR membership whose groundwork and background facilitation has come to fruition today.

(President IAMBR)
Prof. (Dr.) Sushil Dawka, MS
Department of Surgery,
SSR Medical College, Mauritius

Message

On behalf of IAMBR and myself, I extend a warm welcome to all delegates and participants attending this International Conference. Following the success of last year's International Symposium on Diabetes, it became pertinent to organize this meeting on Cancer which is increasingly recognized as a critical public health problem in the world and has now become the third major health threat after diabetes and cardiovascular diseases in the Republic of Mauritius. While communicable diseases continue to burden worldwide populations, it is becoming clear that non-communicable diseases also require the attention of those whose goal is to ensure a better health. Increases in life expectancy and changes in diet and lifestyle promise to increase the cancer burden over the coming years. We are therefore committed to fostering research, education, and advocacy on a variety of levels to increase awareness of cancer. This awareness must be evidence-based and built on data that accurately and completely capture the occurrence, causes, prevention, and treatment of cancer in all types of populations.

The organizing committee of IAMBR in collaboration with SSR Medical College has put up a conference program comprising more than 20 high level presentations that will undoubtedly provide opportunities for discussion on the latest developments in cancer prevention, management and research. A wide range of issues ranging from cancer chemoprevention, molecular cancer strategies, functional foods, nutrigenomics, nanotechnologies, specialized therapies and surgery will be addressed. It is hoped that this conference will continue to foster collaborative initiatives and/or strengthen high caliber research already ongoing at the Ministry of Health and Quality of Life, the University of Mauritius and under the National Research Chair Program based at the ANDI Centre for Biomedical and Biomaterials Research.

I would like to seize the opportunity to heartedly thank all the Conference Organizing Committee members and the Chairman and staff of SSR Medical College for their dedication and support. To our International delegates, I wish you a very nice stay in Mauritius and hope you would have some time to visit the island.

(Vice-President IAMBR)
Prof. (Dr.) Theeshan Bahorun, PhD
National Research Chair (Mauritius Research Council)
ANDI Centre of Excellence for Biomedical and Biomaterial Research,
University of Mauritius, Mauritius

Welcome Address

Dear Delegates,

On behalf of the International Association of Medical and Biomedical Researchers (IAMBR), I extend a warm welcome to all the participants attending 3rd IAMBR international conference on "*Cancer - Present and Future Perspective*" at SSR Medical College, Mauritius. The topics and speakers were carefully chosen to guarantee an exceptionally stimulating and informative scientific event. This conference intends to focus on the latest developments in cancer research, prevention and managements.

I am extremely grateful to our honorable chairman of SSR Medical College Shri R P N Singh for taking the initiative to organize this and providing with all necessary facilities for this event. It is a matter of great joy that this event is being held at our institute – SSR Medical College. My gratitude also goes to Prof. S Shukla (Principal in charge, SSR Medical College), Prof. Sushil Dawka (President, IAMBR), Prof. Theeshan Bahorun (Vice-President, IAMBR), Professor A P Singh (Treasurer), Prof. J-M Nabholtz and Prof. Okezie I Aruoma (International Advisors, Organizing committee), Dr. S S Manraj and Dr. S B Poorun (National Advisors, Organizing committee), and last but not least my wife Prof. Smriti Agnihotri (Assistant Treasurer, IAMBR) for their guidance and encouragement. I would be failing in my duty if I do not acknowledge the generosity and support of other members of the association, SSR MC faculty members and also Dr. Kailash Bahadoor.

I am thankful to all the participants for an overwhelming response to the conference. I am sure that this conference would provide a platform for healthy scientific deliberations and interactions between the researchers and scientists.

(Organizing Secretary)
Prof. (Dr.) Arun Kumar Agnihotri, MD
Head, Department of Forensic Medicine and Toxicology,
SSR Medical College, Mauritius

Organizing Committee

Patron

Shri. R P N Singh
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	Prof. Rimli Barthakur, MS Ophthalmology Department, SSR Medical College Mauritius
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	Dr. Tasneem Ibraheem, MBBS Pharmacology Department, SSR Medical College Mauritius
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	Dr. Nandish Mital, MS Department of Surgery, SSR Medical College Mauritius
	Dr. Vandna Jowaheer, PhD Department of Mathematics, University of Mauritius
	Dr. Fhooblal, MBBS Department of Pathology, SSR Medical College Mauritius

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	Ms. Smita Kachhwaha, MSc Department of Anatomy, S. S. R. Medical College, Mauritius
Auditors	Dr. Vandna Jowaheer, PhD Department of Mathematics, University of Mauritius, Mauritius
	Dr. Savita Bundhoo, MD Specialist Community Medicine, Ministry of Health & Quality of Life, Mauritius

Introduction to speakers

Nicolas Magné
France

Dr. Nicolas Magné is a full professor of medicine in radiation oncology at Jean Monnet Saint Etienne University in France. He is head of the department of radiotherapy, director of research and innovation at the "Institut de Cancérologie Lucien Neuwirth" in France. He is coordinator of the preclinical radiation therapy laboratory in the Faculty of medicine of South Lyon, France. Prof. Magné experienced as an assistant professor in the department of radiation oncology in Institut Gustave Roussy in France. He had also integrated the team of phase I clinical trial in this institute in order to promote and to develop new drugs as a partner of ionizing radiation in clinical strategy setting. His research interests and topics include the supportive care cancer, head and neck oncology, breast cancer, glioblastomas, pharmacological biomodulation and basic science with a particular scope in tumoral stem cells and invasion/migration.

ShyamManraj
Mauritius

Dr. Shyam Manraj is a Consultant in charge of Hospital Laboratory Services in Mauritius. He graduated in medicine and pursued post-graduate studies in Pathology at University Aix-Marseille, France. In 1986, he was appointed at the Ministry of Health and Quality of life as pathologist. He followed WHO courses in Health Systems Research and completed a Diploma in Public Health delivered by University of Bordeaux 2. In 1993, he was appointed National Cancer Registry (NCR) coordinator, a responsibility that he is still holding up to present day. Over the past two decades, cancer registration activities reaching population-based level have been carried out on a continuous basis and results presented by him at various International Association of Cancer Registries (IACR) and AORTIC meetings. During past years, he has played a significant role in the development of a National Cancer Action Plan 2010-2015 for the Republic of Mauritius.

John Crown
Ireland

Dr. John Crown is a Professor and Consultant Medical Oncologist at St. Vincent's University Hospital. In November 2003, he was awarded the Thomas Baldwin Research Chair in Translational Cancer Research from Dublin City University and in December 2004 was awarded the Newman Clinical Research Professorship in the School of Medicine at University College Dublin. He received his medical training at University College Dublin and the State University of New York, and undertook his postdoctoral training on both sides of the Atlantic. He went on to complete his fellowship training in oncology at Mount Sinai Medical Centre and in hematology/oncology at Memorial Sloan Kettering Cancer Centre before joining St. Vincent's University Hospital in 1993.Professor Crown is a founding member and leader of many organizations, including: the All-Ireland Cooperative Oncology Research Group (ICORG), the Anglo-Celtic Cooperative Oncology Group, the European Breast Cancer Dose Intensity Study, and the Irish Society of Medical Oncology. Professor Crown also founded the Clinical Trials Unit at St. Vincent's University Hospital (SVUH), which has developed an international leadership role in oncology trials. In April 2011, Professor Crown was successfully elected as an Independent member to Seanad Éireann and is also a frequent contributor to the lay press, and professional meetings, on the subject of health policy.

Introduction to speakers

Mohun R K Bahadoor
France

Mohun R. K. Bahadoor is a consultant in France, working at the Jean Perrin Regional Comprehensive Cancer Centre of Auvergne (Clermont Ferrand), and in oncogeriatrics, rehabilitation and palliative care at Les Sapins Medical Centre (Ceyrat). He gained a specialty degree on Oncology Network in 2011, and also holds two degrees in cancer treatment: the "Diplôme Universitaire de Carcinologie Clinique" from the Institut Gustave Roussy, University of Paris-Sud, and the degree in Supportive Cancer Care called "Gestion des Infections et Soins Complémentaires en Onco-Hématolgie" from the University of Paris EstCréteil. Under the leadership of Prof. J-M Nabholtz, Dr Bahadoor has participated in several studies in clinical and translational research. He is currently the project manager in the phase II pilot study assessing the efficacy of cisplatin-metronomic cyclophosphamide treatment in patients with metastatic 'triple negative' breast cancer resistant to anthracyclines and taxanes.

Theeshan Bahorun
Mauritius

Dr Theeshan Bahorun is a Professor of the University of Mauritius and has been appointed National Research Chair in Applied Biochemistry since January 2012. He is based at the ANDI Centre of Excellence for Biomedical and Biomaterials Research, University of Mauritius where he heads the Biopharmaceutical unit. Prior to the current role, he occupied a Chair position in Applied Biochemistry at the University of Mauritius. His novel research endeavors are focused on promoting public health nutrition and disease prevention. He was awarded a "Doctorat Sciences de la Vie et de la Santé" in Plant Biotechnology from the University of Lille I (France). He also holds a DEA "Génie Enzymatique, Bioconversion et Microbiologie" from Université de Technologies de Compiègne (France), a "Maîtrise" in "Biochimie Alimentaire" and a "Licence" in Biochemistry from University of Lille I (France). He has been the head of the Department of Biosciences at the University of Mauritius, the Chairman of the Food and Agricultural Research Council and is currently the President of the Society for Free Radical Research Africa (SFRR-Africa) and Vice President of the International Association of Medical and Biomedical Researchers (IAMBR).

Hye-Kyung Na
South Korea

Dr. Hye-Kyung Na is an assistant professor of Sungshin Women's University, Department of Food & Nutrition from 2009. She obtained her PhD degree from the Department of Food & Nutrition of Chonnam National University, South Korea in 1996. After finishing her PhD course, she had a postdoctoral training at Department of Pediatrics and Human Development, Michigan State University in the James E. Trosko's Lab on gap junctional intercellular communication. After relocation to Korea in 2000, she joined the Prof. Young-Joon Surh's research group in Seoul National University, College of Pharmacy and worked there until 2008 as Research Professor. Her work focuses on 1) up-regulation of COX-2 expression causally linked to apoptosis induced by ET-18-O-CH3 2) Anti-inflammatory and anti-proliferative effects of diallyltrisulfide derived from garlic 3) Role of 15-deoxy Δ12,14-prostaglandin J2 in breast carcinogenesis 4) Anti-inflammatory and anti-oxidant effects of EGCG. 5) Role of the catechol estrogen 4-hydroxyestradiol in breast carcinogenesis. Currently, she studies on the molecular mechanisms underlying regulation of 15-prostaglandin dehydrogenase in breast, colon, and stomach carcinogenesis.

Introduction to speakers

Vidushi S N-Bhujun
Mauritius

Dr. Neergheen-Bhujun read biology at the University of Mauritius, graduating in 2001 and completed her PhD in Biosciences in 2008 from the same institution. She has worked in several prominent international laboratories including Faculty of Health and Social Care, London South Bank University, United Kingdom; Dipartimento Di Scienze Dell'Uomo e Dell'Ambiente, Universita di Pisa, Italy and Department of Veterinary Public Health, College of Veterinary Medicine, Seoul National University, Seoul, South Korea. She joined the Department of Health Sciences at the University of Mauritius as lecturer since 2009. Dr. Neergheen-Bhujun is also a researcher in the ANDI Centre for Biomedical and Biomaterials research hosted at the University of Mauritius. Her primary research interest is cancer chemoprevention and the underlying mechanism of actions of medicinal plants and functional food therein in view of the growing global burden of cancer. She is the author and/or co-author of several book chapters and more than 20 publications in peer-reviewed journals.

B S Tuli
Mauritius

Dr. (Col) B.S. Tuli is a Professor and Head, Department of Otolaryngology at SSR Medical College, Mauritius. He has been in medical profession for the last 44 years with a teaching experience of more than 35 years. He was honored with Lifetime Achievement Award for his contribution to ENT in North Zone ENT conference in Jallandhar, India in 2010-11. He retired as Professor and Head of ENT & Commanding Officer of G.H.(TA) from Punjab Government in 2005 earning Good Service Medal from Govt. of India. He worked in various medical institutions and was appointed as Visiting Professor and Head of ENT in a Chinese Medical university of T.C.M. in People's Republic of China. He has delivered many orations including L.H. Hiranandani Gold medal oration on Laryngeal cancer in Simla Medical college in India. He has authored 3 textbooks in Otorhinolaryngology and also has the credit of publishing 30 national and international papers. He has travelled extensively not only in India but also to various institutions in USA, Canada, Pakistan, Dubai and China thus getting plenty of clinical experience.

Nasséra Chalabi
France

Dr. Nasséra Chalabi is specialist in Translational Research and Breast Cancer, and presently acts as scientific director in a clinical and translational research team with the aim to develop a link between basic and clinical researches. Her main topic is the prediction of biomarkers in breast cancer using a combined molecular and clinical approach. By this way, resents axes are in development in triple negative breast cancer and the implementation of a personalized medicine: from patient to bench to bedside. She studied the potential role of micronutrients food containing on breast cancer development. She evaluated the impact of antioxidants on molecular mechanisms involved in breast cancer genesis. By a microarray approach, she correlated lycopene action; major antioxidant mainly concentrated in tomatoes, on BRCA1 and BRCA2 breast cancer genes. Additionally, she also evaluated effects of soy phytoestogens, genistein and daidzein, on epigenetics.

Introduction to speakers

Nabhotlz Jean-Marc
France

Dr. Jean-Marc Nabholtz is a Professor and Chairman, Department of Medicine and Director, Division of Clinical Research at Jean Perrin Comprehensive Cancer Centre of Auvergne in France. After 16 years spent in North America, Dr. Nabholtz moved back to Europe from Los Angeles, California, USA where he was Professor of Medicine, University of California at Los Angeles, and Director of the Cancer Therapy Development Program as well as Director of the Solid Tumour Program at the Jonsson Comprehensive Cancer Centre at UCLA. His main focus is on cancer patient care and the development of new biologic therapies in oncology as well as on the integration of global clinical research processes in oncology. He is also the Founder and past Chairman of one of the largest global breast cancer clinical research group - BCIRG. As Breast Cancer medical oncology specialist, his main interests and achievements are related to several topics: chemotherapy, in development of taxanes in breast cancer; hormone therapy, particularly in the development of third generation aromatase inhibitors; new biologic modifiers, leading pivotal phase III trials for Herceptin and development of new biology-oriented combinations with Herceptin and new biologic modifiers and Development of new translational as well as clinical research processes in oncology.

Shrikant Anant
USA

Dr. Shrikant Anant is a Professor of Cancer Research and RNA biologist with interest in understanding the mechanisms that regulate gene expression at post-transcriptional levels of mRNA stability and translation during tumorigenesis. His lab understands the role of two genes in colon cancer – tumor suppressor and cancer causing gene. Dr. Anant's group has been in the forefront in understanding how dietary prevention agents regulate gene expression. This group has identified a new compound that can be used as a preventive agent for colon cancer and more recently have been working on bitter melon as a dietary agent against colon cancer. He has received many awards including the American Gastroenterology Association Research Scholars Award and the University of Oklahoma Senior Research Scholar award. He was recently invited by NIH to serve in an expert panel to consider the current landscape of natural products and botanical research relevant to the NIH office dietary supplements.

Ethan Will Taylor
USA

Dr. Ethan Will Taylor is Senior Research Professor in the Departments of Chemistry and Biochemistry, and Nanoscience, in the Joint School for Nanoscience and Nanoengineering and obtained his B.Sc. in Chemistry from the University of Winnipeg (1981), then his Ph.D. in Pharmacology and Toxicology from the University of Arizona (1985), where he also held an "Advanced Predoctoral Fellowship" from the Pharmaceutical Manufacturers Association Foundation. From 1986-1987, he was an NIH Postdoctoral Research Associate in Medicinal Chemistry (Univ. of Arizona). Dr. Taylor served 18 years as a faculty member in the College of Pharmacy of the University of Georgia, rising to the rank of Professor in 2001. In 2005, he moved to the University of North Carolina, Greensboro (UNCG). Throughout his career, he has had a focus on computational chemistry and applied bioinformatics, and appointments in various Centers for molecular design and drug discovery, in most cases as a founding member.

Introduction to speakers

Rajesh Agarwal
USA

Dr. Rajesh Agarwal is a Professor and Cancer Pharmacologist in the University of Colorado School of Pharmacy. He is graduated from the chemistry department, Lucknow University, India in 1981 with Ph.D. degree. He moved to Case Western Reserve University, Cleveland, OH, USA as Research Associate where he grew to the Position of Assistant Professor in Dermatology Department in 1992. Beginning 1998, he moved to Colorado as Associate Professor at AMC Cancer Research Center and grew to full professor position in 2000. He is an elected fellow of the American Association for the Advancement of Science (AAAS) in Pharmaceutical Sciences in 2009, recipient of outstanding achievement award from Society of American Asian Scientists in Cancer Research in 2009, and several other national and international awards. In recent years, his research focus is to target not only tumour cells but also tumour microenvironment by natural small molecule agents for cancer prevention and intervention.

Kensese Mossanda
South Africa

Dr. Kensese Mossanda is Professor and Research Coordinator at the Walter Sisulu University (South Africa). He holds a degree in Pharmacy; 3 Master's degrees in: Tropical Medicine and Biology, Clinical Biology and Food sciences and a PhD in Pharmaceutical Sciences (Biochemistry & Toxicology) from the State University of Liege, Belgium (1979). His previous appointments include: Postdoctoral Fellow in many Universities in Europe, USA, Asia and Africa; Professor, Dean of Faculty of Pharmacy, and Head of Clinical Biology Department at the University of Kinshasa, Congo. He has been awarded the Seoul National University (South Korea) prize for an outstanding lecture in 2003 as well as the "Dakota" award (Kyoto-Japan). During the last two decades, he has been awarded more than 25 scholarships, bursaries and fellowships to attend conferences, congresses and workshops. His research expertise includes: biochemistry, toxicology, carcinogenesis, mutagenesis, traditional medicine, chemoprevention and anti-inflammatory activities of medicinal plants.

Bharat Aggarwal
USA

Dr. Bharat Aggarwal is a Ransom Horne, Professor of Cancer Research, Cancer Medicine and Immunology, and Chief, Cytokine Research Section, in the Department of Experimental Therapeutics at the University of Texas M. D. Anderson Cancer Center, Houston, Texas. Dr Aggarwal earned his PhD in Biochemistry from the University of California, Berkeley and received his Post-Doctoral training from the Hormone Research Laboratory at the University of California Medical Center, San Francisco. He then started his career with Genentech Inc where he worked for almost ten years and his work lead to the discovery of TNF- α and TNF-β, an essential component of the immune system; and identification of their receptors. In 1989, Dr Aggarwal was recruited as a Professor of Medicine, Clinical Immunology & Biological Therapy, and Chief of the Cytokine Research section at the University of Texas MD Anderson Cancer Center. Since then Dr Aggarwal has been investigating the "*Role of Inflammatory Pathways Mediated through TNF, NF-kappaB and STAT3, for the Prevention and Therapy of Cancer and other Chronic Diseases*". Dr Aggarwal is inventor/co-inventor on over 33 patents. He has been listed as one of the most highly cited scientist in the world by ISI since 2001. He has also been listed as one of the top 25 researchers in the area of "Apoptosis" in the World.

Introduction to speakers

Okezie I Aruoma
USA

Dr. Okezie Aruoma is Professor of Pharmaceutical and Biomedical Sciences and Associate Dean, Research and Global Affairs. Dr Aruoma serves as the Chair of the Institution Review Board at the American University of Health Sciences (AUHS). Dr Aruoma is an international recognized scientist with over 24 years of experience in pharmaceutical and biomedical research focused on food biofactors, oxidative stress mechanisms, antioxidant pharmacology and the pharmaceutical indications of food biofactors as prophylactic agents. Dr Aruoma is a Chartered Chemist (CChem), Fellow of the Royal Society of Chemistry (FRSC) and a Chartered Scientist (CSci) of the Science Council of the UK. The doctor of science degree (DSc) is a higher doctorate degree awarded in recognition of a substantial and sustained contribution to scientific knowledge beyond that required for a PhD. Dr Aruoma's novel research is focused on promoting public health nutrition and management of diseases of overt inflammation (including diabetes, Alzheimer's disease, rheumatoid arthritis and cancer). Dr Aruoma received the 2012 Research and Publication Achievement Award from the Association of Black Health-Systems Pharmacists and is one of the recipients of the 2012 Fellows status in the American Association of Pharmaceutical Scientists.

Young-Joon Surh
South Korea

Dr. Young-Joon Surh is a Professor and Chief of National Research Laboratory of Molecular Carcinogenesis and Chemoprevention College of Pharmacy at Seoul National University and currently serves as Director of Tumor Microenvironment Global Core Research Center Research Center. Dr. Surh is the recipient of the ASN 2009 MSI Research Award. He received his doctorate degree from the University of Wisconsin. He served as an assistant professor at the Yale University School of Medicine for three years before accepting a position as professor at Seoul National University in 1996. His research has demonstrated a commitment to understanding the fundamental scientific mechanisms underlying observations in cell, tissue, animal models, and clinically significant events related to naturally occurring substances. Recent studies have identified molecular targets for chemoprevention of inflammation and inflammatory signaling, as well as cancer chemopreventive effects of antioxidant phytochemicals and chemopreventive agents in functional foods.

Anupam Bishayee
USA

Dr. Anupam Bishayee is an Associate Professor of Pharmaceutical Sciences at American University of Health Sciences (Signal Hill, CA). He has 25 years combined experience in pharmaceutical education, research, teaching, and administration. Dr. Bishayee's research focuses on elucidation of the cancer preventive and therapeutic effects of medicinal plants, natural products, dietary and synthetic agents using various pre-clinical models. Member. Dr. Bishayee has received several research awards, including "Young Investigator" award (Indo-American Society of Nuclear Medicine and Dublin Institute of Technology, Ireland), "Younger Scientist" award (National Science Council, Canada and Indian Chemical Society), as well as author of "most cited", "most accessed" and "high-impact" articles in Cancer Prevention Research, Molecular Nutrition and Food Research and World Journal of Hepatology, respectively.

Introduction to speakers

Dhanjay Jhurry
Mauritius

Dr. Dhanjay Jhurry gained his PhD in Polymer Chemistry in 1992 from Bordeaux-1 University in France. After spending three years at Flamel Technologies Co. in Lyon, he joined the University of Mauritius and was appointed Professor in 2005. Since January 2012, he has been holding a National Research Chair in Biomaterials and Drug Delivery and currently heads CBBR. Dr. Jhurry founded in 2011 the Centre for Biomedical and Biomaterials Research (CBBR), a centre attached to the University of Mauritius. His mainstream research is at the frontier of polymer science and nanotechnology/nanomedicine including biomaterials and nano drug delivery carriers. Dr. Jhurry is the recipient of various national awards and international recognition, amongst which the first Best Mauritian Scientist Award in 2011, his elevation to the rank of 'Commander of the Order of the Star and Key of the Indian Ocean' in the fields of Research and Tertiary Education by the Republic of Mauritius in 2012, and his decoration by the Republic of France as 'Chevalier dans l'ordre des Palmes Académiques' in Oct 2007. Dr. Jhurry is presently Chairman of the R & D Committee of Mauritius Sugar-Cane Research Institute (MSIRI) and Vice-President of the COMESA Innovation Council.

V Mersch-Sundermann
Germany

Dr. Volker Mersch-Sundermann is a Professor and Medical Director of the Department of Environmental Health Sciences at University Medical Center Freiburg in Germany since 2007. He studied medicine and biology at the Universities of Heidelberg and Mannheim; and between 1999 and 2007 held posts at the Universities of Heidelberg, Trier and Giessen as Professor of Toxicology. His main field of research is genotoxicology, particle toxicology and the influence of indoor air quality on human health. Dr. Mersch-Sundermann is Vice Dean of the Faculty of Medicine, University of Freiburg, Germany.

Scientific Program

Monday, September 16

8:15 – 9:00 hours	Registration
9:00 – 9:30 hours	Inauguration and Welcome addresses
9:30 – 9:45 hours	Cancer a global health issue *Nicolas Magne, Professor and Consultant, Radiation Oncology, Jean Monnet Saint Etienne University, France*
9:45 – 10:00 hours	Tea break
10:00 – 12:00 hours	**Session 1: Global burden on cancer – Trends and Strategies** ***Chair - Prof. J-M Naboltz & Prof. T Bahorun***
10:00 – 10:15 hours	Introduction to topics and speakers – *Session Chairs*
10:15 – 10:45 hours	Cancer registration in Mauritius *Shyam S. Manraj, National Cancer Registry Coordinator, Consultant-in-charge (Pathology Services), MOHQL, Mauritius*
10:45 – 11:15 hours	Molecular strategies in cancer patients *John Crown, Professor and Consultant medical oncologist, St. Vincent's University Hospital, Ireland*
11:15 – 11:45 hours	Optimization of cancer care in the elderly: the oncogeriatric approach *Mohun R K Bahadoor, Consultant, Department of Medicine, Jean Perrin Comprehensive Cancer Centre, France*
11:45 – 12:00 hours	Discussion and conclusion remarks
12:00 – 13:00 hours	Lunch
13:00 – 15:30 hours	**Session 2: Cancers – challenges and opportunities** ***Chair - Prof. Okezie I Aruoma & Prof. John Crown***
13:00 – 13:15 hours	Introduction to topics and speakers – *Session Chairs*
13:15 – 13:45 hours	Chemopreventive effects of traditional plant extracts in MNU related hepatocarcinogenesis *Theeshan Bahorun, Research Chair, ANDI Centre of Excellence for Biomedical and Biomaterials Research, University of Mauritius*
13:45 – 14:15 hours	15-Hydroxyprostaglandin Dehydrogenase as a Novel Target for Chemoprevention of Inflammation-Associated Carcinogenesis *Hye-Kyung Na, Associate Professor, Department of Food & Nutrition, Sungshin Women's University, Seoul, South Korea*
14:15 – 14:45 hours	Dietary Biofactors in the Management of Cancer: Reality or Myth? *Vidushi S N-Bhujun, ANDI Centre of Excellence for Biomedical and Biomaterials Research, University of Mauritius*

Scientific Program

14:45 – 15:15 hours	Challenges and opportunities in head and neck cancer *B S Tuli, Professor, Department of Otorhinolaryngology, SSR Medical College, Mauritius*
15:15 – 15:30 hours	Discussion and conclusion remarks
15:30 – 16:00 hours	Tea break
16:00 – 17:00 hours	**Poster presentations (Venue - A hall near examination room, second floor)**

Tuesday, September 17

9:00 – 13:00 hours	Session 3: Risk factors of cancer *Chair - Prof Y-J Surh & Prof. Bharat B Aggarwal*
9:00 – 9:15 hours	Introduction to topics and speakers – *Session Chairs*
9:15 – 9:45 hours	Risk factors of cancer and Nutrigenomics *Nassera Chalabi, Scientific Director, Clinical & Translational Research Division Jean Perrin Comprehensive Cancer Center, Clermont-Ferrand, France*
9:45 – 10:30 hours	Breast cancer management: from empiric approaches to biology-orientated individualized therapies *Jean-Marc Nabholtz, Professor and Chairman, Department of Medicine, Jean Perrin Comprehensive Cancer Centre of Auvergne, Clermont-Ferrand, France*
10:30 – 11:00 hours	Phytochemicals target notch signaling in colon cancer stem cells *Shrikant Anant, Professor of Cancer Research, The University of Kansas Cancer Center, USA*
11:00 – 11:15 hours	Tea break
11:15 – 11:45 hours	Can tobacco use promote HCV-induced miR-122 hijacking and carcinogenesis? *Ethan Will Taylor, Senior Research Professor, Department of Nanoscience, University of North Carolina, Greensboro, USA*
11:45 – 12:15 hours	Strategies to control prostate cancer by chemoprevention approaches *Rajesh Agarwal, Professor and Cancer Pharmacologist, University of Colorado School of Pharmacy, USA* Role of African diet in the occurrence of digestive and liver cancer *Kensese S. Mossanda, Professor and Research Coordinator, Walter Sisulu University, South Africa*
12:45 – 13:00 hours	Discussion and conclusion remarks
13:00 – 14:00 hours	Lunch

Scientific Program

14:00 – 17:00 hours	Session 4: Prevention and Management of cancer *Chair – Prof. Kensese S Mossanda & Prof. Mohun R K Bahadoor*
14:00 – 14:15 hours	Introduction to topics and speakers – *Session Chairs*
14:15 – 14:45 hours	Anti-Inflammatory life style for prevention and treatment of Cancer: Facts and Fiction *Bharat Aggarwal, Professor of Cancer Research, Cancer Medicine & Immunology; Chief, Cytokine Research Section, MD Anderson Cancer Center, University of Texas, Houston, Texas, USA*
14:45 – 15:15 hours	The impact of nutrition and palliative care in the management of cancer *Okezie I Aruoma, Professor, Pharmaceutical and Biomedical Sciences; Associate Dean, Research and Global Affairs, American University of Health Sciences, CA, USA*
15:15 – 15:30 hours	Tea break
15:30 – 16:00 hours	Cancer Chemoprevention with Bioactive Natural Products *Young-Joon Surh, Professor and Director, Tumor Microenvironment Global Core Research Center Research Center, Seoul National University, Seoul, South Korea*
16:00 – 16:30 hours	Can dietary phytochemicals prevent hepatocellular carcinoma? *Anupam Bishayee, Associate Professor, Pharmaceutical Sciences American University of Health Sciences School of Pharmacy, CA, USA*
16:30 – 17:00 hours	Discussion and conclusion remarks

Wednesday, September 18

9:00 – 11:10 hours	Session 5: Cancer nanotechnology, stem cell and drug development *Chair – Prof Ethan W Taylor & Nicolas Magné*
9:00 – 9:15 hours	Introduction to topics and speakers – *Session Chairs*
9:15 – 9:45 hours	Anti-cancer nanodrugs *D Jhurry, Research Chair, ANDI Centre of Excellence for Biomedical and Biomaterials Research, University of Mauritius*
9:45 – 10:15 hours	The role of nanoparticles in genotoxicity and cancer development *Volker M Sundermann, Professor, Institute of Environmental Health Sciences, University Medical Center Freiburg, Germany*
10:15 – 10:45 hours	Update on the treatment of breast cancer with HER2 amplification *Jean-Marc Nabholtz, Professor and Chairman, Department of Medicine, Jean Perrin Comprehensive Cancer Centre of Auvergne, France*
10:45 – 11:00 hours	Discussion and conclusion remarks
11:00 – 12:00 hours	Closing ceremony

Key notes of speakers

Session 1: Global burden on cancer – Trends and Strategies

Cancer a global health issue

Dr. Nicolas Magne, Professor and Consultant, Radiation Oncology, Jean Monnet Saint Etienne University, France

The global cancer burden is becoming a major threat to many countries. It has been observed in studies mainly carried out in developed countries that the understanding of cancer has improved; And today we have a better knowledge from molecular to biological behavior of tumor cells and it's characteristics, due to advances in pathological techniques. Natural history of cancer is also changing with increasing life expectancy. We know that risk factors are not completely known even if for breast cancer for example we can categorize in 3 risks groups: environmental, biological and hereditary. Additional factors would include age, gender, reproductive factors, endogenous hormones, exogenous hormones, hormone replacement therapy, breast density, previous breast disease and family history. Exposure to estrogen is a key factor in developed settings and more and more this is now true for developing countries. Much of the data shows that many countries will have to face rising cancer incidence as a public health scorge, unless comprehensive cancer plans are devised around screening, early diagnosis and optimized treatment strategies. The major challenge for developing countries will be setting up of infrastructures and empowering the local human resources and investing in training and software structural developments. One example would be to develop centralized clinics equipped with diagnostic tools, surgical, medical and radiation-therapy units with the specialized staff. What we know is that early detection and treatment improves the overall survival rate. Implementing standardized management strategies is hence simpler and achieving this seems possible within reasonable costs. Even if it appears difficult to predict the cost-effectiveness of developing prevention, screening and treatment strategies; one of the fundamental aspects to optimize cancer care is to have a comprehensive approach based on a multidisciplinary team. We have this vast experience in developed countries and today multidisciplinary approach is a standard. The setting up a centralized specialized clinics covering diagnostic tools, pathology and clinical, medical, surgical and radiation oncology. Also the challenge of clinical research can be met within an organized setting thus facilitating the selection of biologically defined subgroups to optimize research. Research patterns have evolved from horizontal to vertical patterns depending on the quality and accessibility to tumorotheques. This collaborative approach with access to appropriate treatment whether surgical, chemotherapy, hormone and targeted therapies and radiation therapy will have a definitive impact for advances in the management of cancer.

Cancer registration in Mauritius

Dr. Shyam S. Manraj, National Cancer Registry Coordinator, Consultant-in-charge (Pathology Services), MOHQL, Mauritius

This presentation is a comprehensive one on the Cancer situation in Mauritius. It starts with a brief overview of cancer care facilities available in the Republic of Mauritius as regards manpower and equipment. This will be followed by a history of National Cancer Registry (NCR), latest figures, and trends over the past two decades and some predictions for the future. National Cancer Registry was set up in 1989 and has been operational on a continuous basis since then. Data has been collected from archives of the unique Pathology and Radiotherapy departments, regional hospital records, private medical laboratories and civil status Office for deaths due to cancer. Latest figures pertaining to the period 2006-2010 are as follows: 3153 cases were registered in males (ASR 107.2),

4545 cases in females (ASR 123.9). Main sites in males were Colon-Rectum, Prostate and Lungs whereas in females breast cancer is by far the commonest site (ASR 48.8) followed by uterine cervix (11.8) and colon-rectum (9.2). 96% of cases were microscopically verified. Cancer mortality survey for the corresponding period showed 2582 deaths in males and 2491 deaths in females. MI ratio was 0.82 in males and 0.55 in females. A National NCCP Action Plan 2010-2015 is presently being implemented. Priority has been given to cancer services manpower development, decentralization of chemotherapy services and research activities. Cancer registration has been scaled up with use of a new cancer registration form and introduction of survival studies for certain prevalent sites has started in 2012. Data from the Republic of Mauritius will be compared to that of other small island developing states (SIDS).

Molecular strategies in cancer

Dr. John Crown, Professor and consultant medical oncologist at St. Vincent's University Hospital, Ireland

The drug treatment of cancer is undergoing a major revolution. Oncology treatment has entered the era of "targeted therapy". These newer drugs sometimes thought of as "magic bullets" have been designed to exploit differences between the cancer cells, and normal cells. Unlike chemotherapy, these newer treatments will be more focused in their effects resulting in a much more favorable toxicity profile. A further fundamental difference, which has occurred, is in the way in which cancer drugs are developed. Formerly, the process was "observational" and based on a fairly sophisticated form of trial and error. In order words, those chemicals that stopped cancer cells growing in the lab, were identified as potential anti-cancer drugs, and taken on to further stages of development. In the modern, "molecular" era, the process begins with the study of the cancer cells themselves, attempting to identify areas of difference from normal cells, and then to develop new drugs to exploit these differences. Not only do molecular therapeutics pose serious challenges for the field of therapy, they also will necessitate dramatic changes in the way the clinical evaluation of new treatments is assessed. With conventional cytotoxic chemotherapy where molecularly unselected patients with disease of a particular histologic type were being studied, it would often be necessary to randomize hundreds or even thousands of patients per arm in a study to detect small but meaningful differences in outcomes such as survival and disease-free survival. Unfortunately, the habits, which were learned in this era, have to an extent continued in the molecular era, and we still find trials that are being conducted in this fashion of molecular therapies. Companies in particular need to understand that while molecularly-determined markets for their new drugs may be numerically smaller than old histologically-determined markets, there is a major economic advantage for them to conduct their research using rational molecular selection. For instance, small benefits may not be deemed insufficiently justifiable by paying authorities for expensive new drugs. It is likely that the larger benefits will be seen in patients who are appropriately molecularly selected. Thus, society, Governments, and insurance companies may decide that it is worthwhile spending a very large amount of money for a particular drug which works extremely well in a relatively small group of patients, rather than paying the same amount of money for a drug which works rather less well in a larger group of patients. In addition, our old attitudes to trials methodology will have to change. I believe we should no longer do any clinical trials, which do not have molecular translational components. In addition, I believe that we need to be selecting patients on the basis of molecular selection from the earliest phase one trials, and should also be looking for hints of efficacy at an early stage of the trials process. Another major challenge, which will face molecular therapeutics, is the possibility that they will not work as well as we thought. The heterogeneity of tumors was one of the principle reasons why most chemotherapy drugs failed to cure most common cancers. However, it also poses a substantial hurdle to molecular therapeutics. It is quite intriguing and perhaps a bit depressing, to realize that even some of the drugs which have attracted such extraordinary interest as advances in resistant tumors such as Sunitinib in renal cell cancer and B-Raf inhibitors in B-Raf mutated melanoma, produce temporary benefits, and ultimately resistance and mutation towards a resistant phenotype occurs.

Optimization of cancer care in the elderly: the oncogeriatric approach

Dr. Mohun R K Bahadoor, Consultant, Department of Medicine, Jean Perrin Comprehensive Cancer Centre, France

The incidence of cancer is expected to double within the next 20 years. In 2009, 37% of all cancers diagnosed in Europe occurred in patients aged over 75. Today nearly 50% of those suffering from cancer are aged over 65, and it is predicted that, by 2030, 70% of all cancer cases will affect this age group. Due to increasing life expectancy, this trend is also expected in countries in transition. In routine clinical practice, only a limited number of tools are available to help with the management of cancer in the older patient. Traditionally in clinical medicine the older population is a neglected group in terms of clinical research, for reasons including comorbidities and practicalities. Oncology research too has concentrated on the younger population. This includes limited oncology trial data in the population aged over 70. For example, adjuvant treatment in breast, colorectal and lung cancers are mostly based on trials conducted in patients aged less than this. Increasing research attention is finally being focused on the older population, but there is a long way to go. It is not just advanced chronological age where the lack of high quality research data is needed, but perhaps even more importantly data in patients who are more advanced in physiological age, and with frailty syndromes. In order to help address the lack of information in how to best manage elderly people with cancer, and to try to provide better care for complex older patients, the specialty of onco-geriatrics was created in France in 2005. Since its inception by the INCa " French Institut National du Cancer", best practice cancer care in the older patient now benefits from a multi-disciplinary approach involving both the oncologist and the geriatrician. There is also a significant emphasis on clinical research being designed for older patients, more relevant patient and public information, and ongoing improvement in training for healthcare professionals. One of the approaches being used is the comprehensive geriatric assessment (CGA). The CGA is a holistic approach used by geriatricians to help assess complex elderly patients and identify key problems or needs, and how treating one aspect may affect another. Assessment of frailty is also important in considering options in cancer care for older patients. The involvement of a geriatrician in cancer management decision-making is hence of great benefit, and it may improve in the quality of care for the older patients with cancer.

Chemopreventive effects of traditional plant extracts in MNU related hepatocarcinogenesis

Theeshan Bahorun[a], *Shalini Verma*[b,c], *Ranjan Kumar Singh*[d], *Okezie I. Aruoma*[e] *and Arvind Kumar*[b]*

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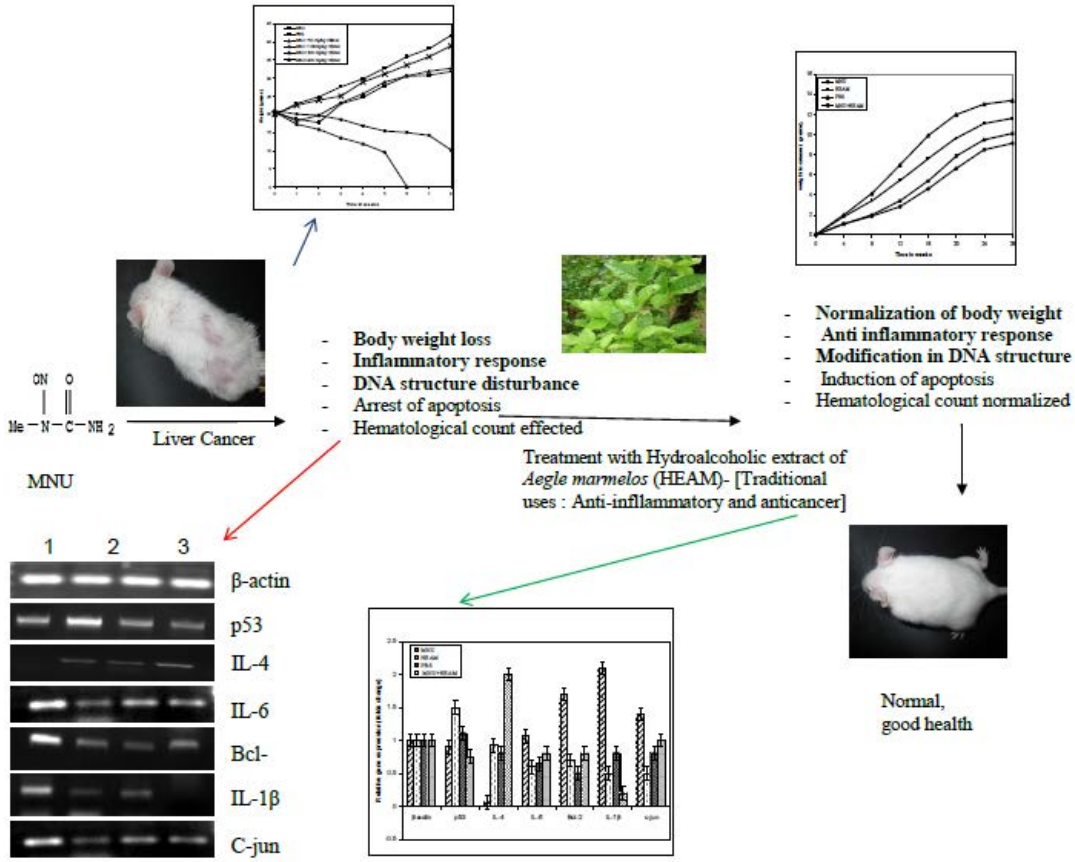
Tobacco smoke and nitrostable foods containing N-methyl N-nitrosourea (MNU) are among the primary causes of liver cancer. 40 week MNU treatment induced increased expressions of inflammatory cytokines (IL-1ß, IL-6) of Bcl-2 at mRNA level and NFκB and IL-1ß at protein level in Balb/c mice. Alteration in hepatocytes was clearly demonstrated in Haematoxyline & Eosin stained liver sections compared to control. MNU primed liver DNA samples revealed an interference of MNU in nucleic acid bases and structure, reflected by a peak shift at 1456 cm-1 and shoulder formation at 1357 cm-1 compared to control DNA samples. The understanding of molecular changes that underlie cancer development offers the prospect of utilizing functional supplements from traditional medicinal plants to augment therapies that can specifically target malfunctioned genes and signaling pathways in cancer. Chemoprevention strategies that are increasingly advocated involve the use of phytochemicals, functional foods, nutraceuticals, and even whole plant extracts to prevent, arrest or reverse the cellular and molecular processes of carcinogenesis. To substantiate the beneficial claims ascribed to *Aegle marmelos* (L.) Corrêa (Rutaceae), the hepatoprotective potential of its leaf extract was studied using the MNU induced hepatocarcinogenesis Balb/c mice model. After dose selection, 40 mice were randomly assigned to 4 groups: I (control), II (intraperitoneally (i.p) primed with 50 mg/kg MNU), III (100 mg/kg A. marmelos hydroalcoholic extract (HEAM) i.p) and IV (MNU + HEAM, i.p). Inflammatory (IL-1ß, IL-6), anti-inflammatory (IL-4) cytokine expression, apoptosis (Bcl-2) and tumor related (p53, c-jun) genes were assessed at mRNA level. HEAM effects on hematological parameters were examined. HEAM treatment decreased IL-1ß, IL-6, Bcl-2 and c-jun expressions by 90, 25, 53 and 30% respectively. p53 and IL-4 expressions were up-regulated by 1.5 and 2 fold. MNU decreased hemoglobin concentration (25%), lymphocyte count (42%) and increased leukocyte (100%), platelet (4 fold), neutrophil (43%), monocyte (10 fold) and eosinophil (10 fold) counts in Group II mice while HEAM modulated the same parameters by -7%, -21%, +24%, +3 fold, +12%, +3 fold and +4 fold respectively in MNU induced mice compared to control. HEAM protective effect was confirmed by Raman spectroscopy where the MNU induced peak at 1252 cm-1 was normalized. DNA fragmentation data suggest apoptosis as one of the protective mechanisms of HEAM. The hepatoprotective, anti-carcinogenic and immunomodulatory effects of A. *marmelos* extract indicate potential beneficial effects in cancer therapy.



15-Hydroxyprostaglandin Dehydrogenase as a novel target for chemoprevention of inflammation-associated carcinogenesis

Dr. Hye-Kyung Na, Associate Professor, Department of Food & Nutrition, Sungshin Women's University, Seoul, South Korea

15-Hydroxyprostaglandin dehydrogenase (15-PGDH) is the key enzyme that catalyzes the first step in the inactivation of PGE2. 15-PGDH has been known to be as a physiological antagonist of COX-2. In the present study, we have observed that expression of 15-PGDH is decreased in dextran sodium sulfate (DSS)-treated mice mucosa, while expression of COX-2 increased. To determine whether 15-PGDH is negatively regulated by COX-2, we utilized a selective COX-2 inhibitor celecoxib. Oral administration of celecoxib increased the 15-PGDH expression while the same treatment decreased COX-2 expression in DSS-treated mouse colon. Moreover, 15-PGDH expression in colonic mucosa following treatment with AOM plus DSS was more prominent in COX-2 knockout mice than that observed in COX-2 wild type animals. Likewise, levels of constitutively expressed 15-PGDH were higher in COX-2 knockout mice. In patients with colon tumors, the expression of 15-PGDH was markedly reduced in adenomas and carcinomas, compared with normal surrounding tissues. These finding suggest that expression of 15-PGDH is negatively regulated by COX-2, which may contribute to the inflammation-associated colon carcinogenesis.

Dietary Biofactors in the Management of Cancer: Reality or Myth?

Dr. Vidushi S N-Bhujun, ANDI Centre of Excellence for Biomedical and Biomaterials Research, University of Mauritius, Mauritius

In 400 B.C. Hippocrates said, "Let thy food be thy medicine and thy medicine be thy food." Despite technological and cultural advances, the essence of these words has seen contemporary resurgence through renewed interest in food and their ability to reduce the incidence of chronic diseases. Thus,

the search for novel and effective cancer chemopreventive agents has led to the identification of various naturally occurring compounds from the diet. Over the last decade, there has been extensive preclinical and clinical research to validate the role of dietary factors in the management of cancer. Ideally, the biofactor is expected to restore normal growth control to preneoplastic or cancerous cells by targeting multiple biochemical and physiological pathways involved in tumor development, while minimizing toxicity in normal tissues. A number of the dietary biofactors has the capacity to interact with multiple molecular targets and appears to be relatively nontoxic, at least at the doses tested. Since cancer has a long latency period, the role of diet and diet-derived components has gained considerable attention. Despite the global cognizance of the cancer chemopreventive effects of dietary biofactors, most of the claims about their beneficial effects in humans have been based on biochemical in vitro tests or animal experiments with limited data from human studies, thus questioning their potential in the management of cancer.

Challenges and opportunities in head and neck cancer

Dr B S Tuli, Professor, Department of Otorhinolaryngology, SSR Medical College, Mauritius

Cancer Diagnosis… last thing anybody would like to listen from his doctor. Head and neck cancers are a group of disease involving so many organs in Head and neck region. These are the most visible cancers and produce early symptoms. It afflicts all communities worldwide. Approximately more than 10 million people are diagnosed with cancer every year and 6 million die of cancer every year. Nearly 25 million persons are living with cancer showing a 19% increase in incidence and 18% increase in mortality in spite of newer diagnostics and therapeutic techniques. Cancer has become the third major health threat after diabetes and cardiovascular diseases in the Mauritius .Nearly 1400 new cases of cancers are reported and 950 cancer deaths occur each year. In 2008, cancers accounted for 11.9% of all deaths in the country. There were, in total, 2286 and 3280 new cases of cancer in men and women respectively. In 2005-2008, 58% of all female cancers occurred in the age group of 15-60 years, while 1.7% of all cases occurred in children below the age of 14 years. The total number of new cases has risen by 41% and 40% in men and women respectively between 1992 and 2008. Head and Neck cancer in Mauritius-2011 data, Carcinoma Larynx stands at number one with 7%, carcinoma hypopharynx including post cricoid region and pyrifrorm sinus is next with 6.8% and nasopharynx carcinoma in 3.7% persons of Chinese origin mainly. Oral cavity, paranasal sinuses, orbit, thyroid tumors are seen occasionally. Avoiding risk factors and lifestyles will help to reduce the incidence of some of the preventable cancers in the population. Tobacco smoking is unequivocally associated with a variety of cancers mainly those of the lungs, mouth and throat. The development of oral cavity like uterine cervix cancer in women is related to sexual lifestyles and the Human Papilloma virus. Many cancers are curable, e.g. uterine cervix, breast, colon, mouth and throat, blood cancers and many childhood cancers, if they are diagnosed early. For this to be a reality, it is necessary that the public is made aware of early symptoms and signs, health professionals are educated about cancer, and treatment facilities are provided to enable effective therapy. In general, one-third of all cancers are preventable, one-third is treatable and remaining one third is at present incurable. Palliative care provision, which includes the control of pain and relief of symptoms, needs to be structured and patient-centered. This aspect of cancer control costs little and yet is important in improving the quality of life of cancer patients. Tumor markers are molecules occurring in blood or tissue that are associated with cancer and whose measurement or identification is useful in patient diagnosis or clinical management. Tumor markers are most useful for monitoring response to therapy and detecting early relapse. Treatment Protocol depends upon the age & profession of patient, extent of tumor, site of tumor, histology of tumor, neck Nodes, distant metastasis, expertise of surgeon and facilities available for the Surgery. Treatment may be conservative or radical surgery, radiotherapy, chemotherapy or Combination of any of these depending upon the stage of tumor. Role of anti cancer diet also needs to be taken care of in the preventive aspect of this dreadful menace.

Session 3: Risk factors of cancer

Risk factors of cancer and Nutrigenomics

Dr. Nassera Chalabi, Scientific Director, Clinical & Translational Research Division Jean Perrin Comprehensive Cancer Center, Clermont-Ferrand, France

Since the complete sequencing of the human genome, the era of the "omics" appeared. Among them, a new discipline called "Nutrigenomics" emerged from the interface of nutrition research and genetics. Its aim is to understand how nutrients modulate gene expressions. This powerful tool allows determining new biomarkers and the molecular pathways by which our diet may have a potential protective effect against degenerative diseases such as cancer. In one hand cellular metabolism produce continuous oxidative stress and reactive oxygen species with mutagenic and oncogenic effects. On the other hand, diet provides natural antioxidants presents in various fruits and vegetables that may prevent diseases. In this presentation, we will report the main antioxidants provided by diet and the main results from epidemiological studies of their role in health. In the second part, we will describe how nutrigenomics could provide new insights in nutrition research and innovative developments through neutraceutical products and a "personalized medicine". In breast cancer, women carrying a germline mutation in BRCA1 gene have a risk of 60 to 80% to develop a breast cancer and 20 to 40% for ovarian cancer. Nevertheless, majority of breast cancer cases are not due to these two high penetrance genes. Sporadic breast cancer could result from an over expression of BRCAI and BRCA2 genes but also from environmental factors. In this case, the role of low penetrance genes and environmental factors in the ætiology of breast cancer could be underlined. Low penetrance genes are involved in genetic polymorphisms, which could increase breast cancer susceptibility. These genes are implicated in carcinogen detoxication (gluthation S-transferases GST, N-acetyl-transferase NAT), estrogen metabolism (cytochrome P450 superfamily) or DNA repair mechanism (XRCC). So, we will conclude this presentation with a report on breast cancer susceptibility through polymorphisms.

Breast cancer management: from empiric approaches to biology-orientated individualized therapies

Dr. Jean-Marc Nabholtz, Professor and Chairman, Department of Medicine, Jean Perrin Comprehensive Cancer Centre of Auvergne, Clermont-Ferrand, France

Breast Cancer is becoming a major burden worldwide. Recent studies have suggested a better awareness of this disease. Despite the fact that the incidence and epidemiology of breast cancer appear different in many countries, the lessons drawn from the experience in developed countries point out the importance of screening programs and improved therapeutic strategies based upon a better understanding of the biology of breast cancer. The major challenge today is the setting up of proper infrastructures to improve the transfer of technology from developed countries to developing countries, through the implementation of standardized management strategies globally simpler and cost effective. We have witnessed the transformation from empiric approaches with traditional chemotherapy and endocrine therapy to the use of targeted therapies. This evolution has been possible as today; we have a better understanding of the tumor not only from a histopathological point of view, but on a further level with molecular biology. Characterization and better understanding of the pathological model have lead to better use of drugs with "key-hole" treatment strategies showing efficient control of breast cancer at different stages of the disease from early to metastatic. Additionally, processes aiming at including clinical and translational research in patient care, although complex, have lead to the development and extensive use of these immunological and targeted therapies. They have a wide range of targets represented by HER2, vascular endothelial growth factor, epithelial growth factor, mTor (mammalian target of rapamycin), and others protein kinase. These include anti HER2 monoclonal antibody, like trastuzumab; protein kinase inhibitor like lapatinib; mammalian target of rapamycin inhibitor like everolimus, and even

newer drugs like pertuzumab and TDM-1 blocking new biologic pathways in different tumor sub-types, according to modern molecular classification. Their accurate use has already shown optimized results, as observed during the developmental phases, by improvement of overall survival and progression free survival of patients benefiting from these therapies. Such collaborative approaches with access to screening programs, appropriate treatment management and research programs with the implementation of biologic-oriented individualized therapies are the necessary conditions in order to have a definitive impact for further advances in breast cancer management.

Phytochemicals target notch signaling in colon cancer stem cells

Dr. Shrikant Anant, Professor of Cancer Research, The University of Kansas Cancer Center, USA

Cancer Stem Cells (CSCs) are a small population of cells within the tumor that have the ability to self renew and give rise to mature daughter cells. Within the normal intestine, multiple markers were identified to enrich for a population of cells that have stem-like properties including Bmi 1, LGR 5 and hTERT. However, the value of these for isolation and studying stem cells has not been well documented. In this regard, we recently identified a novel quiescent stem cell maker, DCLK 1. Also DCLK+ cells isolated from colon cancer form colonospheres, and form tumors in nude nice. Notch signaling, an important factor in stem cell renewal is also upregulated in DCLK+ cells. Notch-1 is a cell membrane associated protein, and upon ligand engagement, goes through a series of cleavage activities, including an intracellular event catalyzed by the y-secretase complex, releasing the intracellular domain of the transmembrane receptor Notch (NICD). NICD translocates to the nucleus, where it interacts with cofactor CBF-1 and activate transcription of target genes. We have now determined the effects phytochemicals such as curcumin (an active ingredient in the spice turmeric and honokiol (an active ingredient in magnolia bark) on Notch signaling and DCLK1 activity. Both curcumin and honokiol inhibited DCLK1-driven colonosphere formation and tumor growth in nude mice. In addition, the compounds inhibited DCLK1 expression in colon cancer cells. We also observed that the compounds inhibited Notch-1 expression and that of its ligand, Jagged-1, and target genes Hes-1 and Hey-1, and that of membrane of the y-secretase complex. These data suggest that curcumin- and honokiol-mediated down regulation of the Notch signaling pathway results in inhibition of colon CSCs thereby suppressing tumorigenesis.

Can tobacco use promote HCV-induced miR-122 hijacking and carcinogenesis?

Dr. Ethan Will Taylor, Professor, Department of Nanoscience, University of North Carolina, USA

Chronic hepatitis C virus (HCV) infection is a well-recognized risk factor for hepatocellular carcinoma (HCC). As a co-risk factor, the role of tobacco use in HCV-driven carcinogenesis and relevant underlying mechanisms remain largely unclear. The latest discoveries about HCV replication have shown that HCV RNA hijacks cellular miRNA-122 by forming an Ago2-HCV-miR-122 complex that stabilizes the HCV genome and enhances HCV replication. Our previous work[1] has demonstrated that aqueous tobacco smoke extract (TSE) is a potent activator of HIV replication via TSE-mediated viral protection from oxidative stress and activation of a set of genes that facilitate HIV, such as DDX3. Since HCV is, like HIV, an enveloped virus that should be equally susceptible to lipid peroxidation, and since one of the TSE-upregulated genes, the DDX3 helicase, is known to facilitate HCV replication, we hypothesize that 1) tobacco use can similarly enhance HCV viability and replication, and promote HCC progression by up-regulation of DDX3, and 2) by competing for binding with miR-122 as a competing endogenous RNA (ceRNA), HCV replication can liberate miR-122's direct target, oncogenic gene cyclin G1 (CCNG1); furthermore, simultaneous tobacco use can synergistically enhance this competing effect via HCV upregulation. Our hypotheses may provide a foundation for better understanding of carcinogenesis in HCV-driven HCC and the potential role of tobacco as a cofactor. Disrupting the HCV ceRNA effect could be the basis of a new strategy for designing anti- HCV/HCC drugs.

1. Zhao, L., Li, F., Zhang, Y., Wang, Z., Yu, C., Taylor, E.W. (2010) Mechanisms and genes involved in enhancement of HIV infectivity by tobacco smoke. Toxicology, 278: 242-48.

Strategies to control prostate cancer by chemoprevention approaches

Dr. Rajesh Agarwal, Professor and Cancer Pharmacologist, University of Colorado School of Pharmacy, USA

Cancer is a major public health problem in the United States and other parts of the world. As per the American Cancer Society, last year, there were 241,740 new cases and 28,170 deaths due to this cancer in the US. In prostate cancer patients diagnosed at early stage of the disease with only localized growth of the cancer, 5-year survival rate is high and is near to 100%. However, in prostate cancer patients with metastasis, the median survival is reduced to only 12-15 months, suggesting the importance of prevention, early diagnosis and intervention to target the disease progression to metastatic stage to reduce mortality. Due to existing screening measures, prostate cancer is mostly diagnosed at early stages when the disease is still localized in the prostate or surrounding tissues; however, existing curative measures, including radiotherapy, chemotherapy and anti-androgen therapy have significant side effects. Therefore, often, patients diagnosed with localized indolent and asymptomatic disease are not treated initially to avoid treatment side effects such as hair loss, pain, urinary incontinence, and permanent impotence etc. We believe that chemoprevention approaches could fill this gap and prevent the disease progression to advanced metastatic stage without significant side effects. Furthermore, preventing or inhibiting the growth and progression of prostate cancer through non-toxic chemopreventive agents could be an ideal strategy considering the fact that prostate carcinogenesis involves multiple processes and usually requires more than a decade for the development of clinically significant disease. In last 15 years, my research group has established the chemopreventive efficacy and utility of a flavonoid named silibinin (C25H22O10), which is isolated from the seeds of Silybummarianum (L.) Gaertn (Family Asteraceae). Now, there is plenty of literature illustrating the cancer chemopreventive efficacy of silibinin against prostate cancer in cell culture, animal models and human studies. Several molecular mechanisms have been propounded to describe silibinin' broad spectrum cancer chemopreventive action including the induction of cyclin dependent kinase inhibitors and E-cadherin as well as inhibition of epidermal growth factor receptor and NF-κB pathways. Besides, now we have ample proofs that silibinin targets several tumor microenvironment components including endothelial cells, cancer-associated fibroblasts, macrophages, osteoclasts, etc. to exert its cancer chemopreventive, angiopreventive and anti-metastatic efficacy against prostrate cancer. Lately, clinical trials are being conducted to examine chemopreventive usefulness of silibinin in prostate cancer patients. In my presentation, I will discuss the mechanistic details of chemopreventive efficacy of silibinin against prostate cancer cells and tumor microenvironment components as well as its translational usefulness.

Role of African diet in the occurrence of digestive and liver cancer

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Squamous cell carcinoma of the esophagus (SCCE) is second cancer (incidence: 14.5%) in black South African men. A considerable number of studies have confirmed the association of hepatocellularcarcinoma (HCC) with hepatitis viral infections (HBV, HCV) and the consumption of mycotoxins contaminated food especially aflatoxins (AFB1) with contributing risk factors such as alcohol intake and cigarette smoking (incidence is 23-26% in Africa). The diet of the majority of African populations consists indeed largely of maize, cassava flour and other cereals prone to fungal infestation and thus to contamination by mycotoxins. In contrast, an expanding body of evidence from epidemiological and laboratory studies demonstrated that edible plants as a whole, or their ingredients have substantial protective effects on human carcinogenesis. In this study, we investigated African diet and beverage consumed in areas with low risk of cancer for identification of anti-oxidative, anti-mutagenic and anti-inflammatory/chemo- preventive activities for adopting them in areas with high risk of cancer. A variety of food plants from households: Maize (Zm, Zea mays), Ligusha (LI, Corchorystridens), Calabash (CA, Lagenariasiceraria), Bambara groundnut (BB,

Vignea subterranean), have been investigated for mycotoxin contamination. Rooibos tea (RT, Aspalathuslinearis), Cancer bush (CB, Sutherlandiafructescens), Devil's claw (DV, Harpagophytumprocumbens), African potato (Hh, HypoxisHemerocallidea), Pumpkin leaves (Cm, Cucurbita maxima), Sorghum beverage (Sb, Sorghum bicolor) considered as staple foods, were collected in Southern African areas with low risk of cancer. Anti-oxidative activity was demonstrated in plant extracts by their ability to scavenge superoxide anion, bleach the stable 1,1-diphenyl-2-picrylhydrazil (DPPH) radical and protect DNA supercoiled after DNA strand scission induced by UV-photolysis of H2O2. Evaluation of intracellular radical scavenging activities was performed using inhibition of zymozan-induced chemiluminescence in Raw 264.7 macrophages and in human granulocytes. Anti-mutagenic activity was evaluated against Aflatoxin (AFB1) with and without metabolic activation by incubation with Salmonella typhimurium strain TA 102 reversion test. Anti-inflammatory/chemo-preventive activities were detected using Western blotting analysis performed for measurement of COX-2 mRNA expression after incubation of ethanolic plant extracts with the immortalized human breast epithelial (MCF-10A) cells in vitro and in mouse skin in vivo using 12-O-tetradecanoylphorbol-13-acetate (TPA) as tumor promoter stimulating COX-2 expression. Samples from households have shown relatively high level of potential mycotoxin-producing fungi including Fusarium, Alternaria and Aspergillus. Reduction in the relative numbers of epiphytic and endophytic fungi has been observed upon cooking process. In contrast, indigenous African edible plants (LI, CA, DV, Hh, Cm), and beverage (RT and Sb) potentially possess variable anti-oxidative, anti-mutagenic, anti-inflammatory and chemo-preventive properties in addition to their nutritional benefits. Those food plants do have the capacity through their content in phenolic compounds to protect cells against oxidative DNA damage leading to cancer. The molecular mechanism underlying those activities was elucidated for CB, DEV and RT. These food plants could be recommended in the diet of populations living in areas with high risk of digestive and liver cancers for reducing their incidence.

Anti-Inflammatory life style for prevention and treatment of Cancer: Facts and Fiction

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Chronic infections, obesity, alcohol, tobacco, radiation, environmental pollutants, and high-calorie diet have been recognized as major risk factors for the most chronic diseases including cancer. All these risk factors are linked to chronic diseases through inflammation. While acute inflammation that persists for short-term mediates host defense against infections, chronic inflammation that lasts for long-term can predispose the host to various chronic illnesses, including cancer. Linkage between cancer and inflammation is indicated by numerous lines of evidence; first, transcription factors NF-κB and STAT3, two major pathways for inflammation, are activated by most cancer risk factors; second, an inflammatory condition precedes most cancers; third, NF-κB and STAT3 are constitutively active in most cancers; fourth, hypoxia and acidic conditions found in solid tumors activate NF-κB; fifth, chemotherapeutic agents and gamma-irradiation activate NF-κB and lead to chemoresistance and radioresistance; sixth, most gene products linked to inflammation, survival, proliferation, invasion, angiogenesis, and metastasis are regulated by NF-κB and STAT3; seventh, suppression of NF-κB and STAT3 inhibits the proliferation and invasion of tumors; and eighth, most chemopreventive agents mediate their effects through inhibition of NF-κB and STAT3 activation pathways. Thus suppression of these proinflammatory pathways may provide opportunities for both prevention and treatment of cancer. We will discuss the potential of various dietary agents, also called nutraceuticals derived from spices, lentils, nuts, fruits, and vegetables; and agents from traditional medicine in suppression of inflammatory pathways and their role in prevention and therapy of cancer.

The impact of nutrition and palliative care in the management of cancer

Dr. Okezie I Aruoma, Professor, Pharmaceutical and Biomedical Sciences; Associate Dean, Research and Global Affairs, American University of Health Sciences, CA, USA

Chemotherapy to patients with cancer remains an effective mode of treatment of the disease, but it is associated with many side effects including mild or dose-limiting toxicities such as alopecia, myelosuppression, gastrointestinal dysfunctions, neurologic toxicities, and immune suppression which results in infections and cancer cell proliferation. Although economic analysis of treatment in health care systems may be applied to the full range of interventions that make up a cancer service, the economic impact of cancer in health care systems remains one that much attention, in the context of complementary medicine. Palliative care provided by a specialist who works with a team of other health care professionals, such as doctors, nurses, registered dieticians, pharmacists, and social workers, is comfort care given to a patient who has a serious or life-threatening disease, such as cancer, from the time of diagnosis and throughout the course of illness. Palliative care begins at diagnosis and continues during cancer treatment and beyond advocating the principles of comfort and support. It is now increasingly recognized that palliative care improves the quality of life of patients and family members, as well as the physical and emotional symptoms of cancer and its treatment. In the main, the goal of palliative care is to prevent or treat, as early as possible, the symptoms and side effects of the disease and its treatment, in addition to the related psychological, social, and spiritual problems. The physical symptoms such as pain, fatigue, loss of appetite, nausea, vomiting, shortness of breath, and insomnia can be relieved with medicines or by using other methods involving palliative care, such as nutrition therapy, physical therapy, or deep breathing techniques. Palliative care can help patients address depression, anxiety, and fear. Here it is imperative for care experts to provide counseling, recommend support groups, hold family meetings, or make referrals to mental health professionals in support of patients. The palliative care team may direct patients and families to resources that can help with financial counseling,

understanding medical forms or legal advice, or identifying local and national resources, such as transportation or housing agencies. With a cancer diagnosis, patients and families often look more deeply for meaning in their lives. There is the question that cancer brings patients more faith but patients may also question their faith as they struggle to understand why cancer happened to them. Indeed palliative care experts can help patients explore their beliefs and values so that they can find a sense of peace or reach a point of acceptance that is appropriate for their situation. Ultimately, nutrition therapy may help patients recover more quickly and spend less time in the hospital. Nutrition in palliative care and at the end of life should be one of the goals for improving quality of life. It is important to address issues of food and feeding in order to assist in the management of troublesome symptoms as well as to enhance the remaining life for a cancer patient.

Cancer Chemoprevention with Bioactive Natural Products

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Recently, much attention has been focused on the use of naturally occurring substances for cancer prevention or as adjuncts to conventional anticancer therapy. Numerous biologically active substances derived from fruits, vegetables, nuts, herbs and spices, collectively termed 'phytochemicals', have been reported to possess the cancer preventive/therapeutic potential. The chemopreventive effects that most edible phytochemicals exert are likely to be the sum of several distinct mechanisms. These include blockage of metabolic activation and DNA binding of carcinogens, stimulation of detoxification, repair of DNA damage, suppression of cell proliferation and metastasis or angiogenesis, induction of differentiation or apoptosis of precancerous or maliganant cells, etc. Recently, it has been known that common dietary chemicals act on the human genome, either directly or epigenetically, to alter gene expression, thereby regulating carcinogenic processes. The rapid progress in our understanding of the cellular signal transduction pathways that are subjected to fine-tuning has paved the way to unveiling the molecular milieu of cellular homeostasis. Cancer arises when such sophisticated cellular growth-signaling network is deregulated or disrupted. Since the cellular signaling network often goes awry in carcinogenesis, it is fairly rational to target intracellular signaling cascades for achieving chemoprevention. Targeted modulation or restoration of the intracellular signaling network by use of phytochemicals thus offers a unique strategy for preventing abnormal cell proliferation and other malfunctions. Research directed toward elucidating underlying molecular mechanisms of chemoprevention or chemoprotection with edible phytochemicals has recognized components of signal transduction networks as potential targets. Modulations of cellular signaling pathways represent an essential component of molecular target-based chemoprevention of cancer. Numerous studies have been reported with the global biochemical profiling technologies, such as DNA microarray, proteomics, metabolomics, lipidomics, etc., to identify and characterize a series of critical molecules/changes in the inflammatory signaling. It is by gaining this type of mechanistic understanding of a disease that researchers will unlock the keys to discovering new diagnostics and therapeutic strategies in the management of inflammation-associated metabolic disorders.

Can dietary phytochemicals prevent hepatocellular carcinoma?

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Hepatocellular carcinoma (HCC) is the main primary malignant tumor of the liver and one of the most life-threatening human cancers worldwide, resulting in almost one million deaths per year. The geographic areas with highest risk for HCC include Eastern Asia and sub-Saharan Africa. The incidence of HCC has been rising worldwide, especially in the United States, where 70% increase has been registered during the last 25 years. Approximately, 31,000 new cases of liver cancer (including intrahepatic bile duct cancer) and nearly 22,000 deaths due to this fatal disease have been

estimated to occur in the US in 2013 alone. Viral hepatitis (B and C), alcohol abuse, nonalcoholic steatohepatitis, autoimmune hepatitis, hereditary metabolic diseases, and exposure to dietary carcinogens (including aflatoxins and nitrosamines) significantly contribute to the development of HCC. Chronic unresolved inflammation is associated with persistent hepatic injury and concurrent regeneration, resulting in sequential development of fibrosis, cirrhosis, and eventually HCC. Although surgical resection is the treatment of choice for limited number of patients, it involves a high risk of post-operative complications and tumor recurrence. Liver transplantation is the most effective way to improve the survival of HCC patients, but this option has limitation due to inadequate number of qualified donors as well as occurrence of the disease in the transplanted liver. Currently, sorafenib is the only drug approved by the US Food and Drug Administration for the treatment of advanced HCC. Although this drug increases the median survival time by nearly three months, it is expensive (monthly treatment cost nearly $5,400) and exerts severe adverse effects, including a significant risk of bleeding. In view of the severity of the disease and the lack of effective and safe treatment options, chemoprevention (use of natural and synthetic agents to reverse, suppress or prevent carcinogenesis) seems to be a prudent approach to reduce the current morbidity and mortality associated with HCC. Several epidemiological studies suggest reduced risk of various cancers with diet rich in fruits and vegetables. Phytochemicals, present in fruits, vegetables, nuts and spices, have shown significant promise for cancer prevention due to their proven ability in selectively killing neoplastic cells in vitro and suppressing carcinogenesis in preclinical animal models. Numerous phytochemicals from dietary sources possess potent anti-inflammatory and antioxidant properties, which play vital roles in suppressing inflammation and oxidative stress implicated in liver cancer. A large number of *in vitro* and *in vivo* studies provide convincing evidence that dietary phytochemicals modulate several signal transduction pathways and affect multi-step carcinogenesis process, including initiation, promotion, and progression. Dietary phytoconstituents, which have shown significant antihepatocarcinogenic activity in preclinical models of liver cancer, include caffeic acid, β-carotene, curcumin, diallyl sulfide, epigallocatechin-3-gallate, genistein, d-limonene, quercetin, resveratrol, and silibinin. This presentation will highlight up-to-date results on preclinical liver cancer preventive studies of highly promising phytoconstituents, including several studies conducted in author's laboratory that involve phytochemicals present in black currants, grapes, and pomegranate. The current limitations, challenges, innovative approaches, and future directions of research on dietary phytochemicals to prevent human liver cancer will also be critically discussed.

Anti-cancer nanodrugs

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Some of the emerging technologies in nanomedicine include liposomes (80-200 nm), nanoparticles and nanocapsules (20-1000 nm), polymer-drug conjugates, polymer-protein conjugates, antibody-drug conjugates, albumin-drug conjugates and block copolymer micelles (50-200 nm). Over 40 formulations are currently on the market to combat various diseases and many more under clinical trials.[1,2] Current chemotherapeutic drugs such as paclitaxel and doxorubicin suffer from low solubility, chemoresistance and nonselective cytotoxicity towards both cancerous and normal cells, causing severe side effects. Several drug conjugates are currently on the market to fight cancer more efficiently. Drug conjugates consist of antibodies to which a highly potent toxin is attached via a linker and generally administered intravenously. For example, Adcetris, a drug conjugate, showed remarkable results in eliminating Hodgkin's disease tumors or caused them to shrink. Survival of patients under recently approved FDA Kadcyla against breast cancer is about 25% longer compared to commonly used treatment. Nanodrugs in cancer chemotherapy (cisplatin, carboplatin, 5-fluorouracil, doxorubicin, paclitaxel, dactinomycin, etc.) also seem to be effective providing low side effects and targeted action on cancer cells. The nano drugs are target selective and specific towards tumors only resulting into better treatment. The commercialization of anti-cancer nanocarriers – nanoparticles, drug-polymer conjugates, liposomal formulations – is now a reality, to cite Doxyl and Caelyx. Several systems based on polymeric micelles are also in clinical phase development[3]. This is an area where our group has a major interest. Most polymeric micelles are based on PEG as hydrophilic shell with biodegradable polyester such as poly (lactide) or polycaprolactone as inner core. The controlled or sustained release of drugs, their increased bioavailability and targeting have been demonstrated. We have developed different types of polymeric micelles[4,5] and tested their efficacy in the loading and release of anti-cancer drugs paclitaxel and doxorubicin. These systems have yielded quite promising results in vitro which have now to be confirmed in vivo. The presentation will attempt to give an overview of recent developments in the area of chemotherapy including systems developed at the Centre for Biomedical and Biomaterials Research.

References

1. Duncan R, Gaspar R. Nanomedicine(s) under the Microscope. *Molecular Pharmaceutics*. 2011;8:2101-41
2. Liu Y, Niu T-S, Zhang L, Yang J-S. Review on nano-drugs. *Natural Science*. 2010;2(1):41-8.
3. Ali I, Rahis-Uddin, Salim K, Rather MA, Wani WA, Haque A. Advances in nano drugs for cancer chemotherapy. *Curr Cancer Drug Targets*. 2011;11(2):135-46.
4. Jeetah R, Bhaw-Luximon A, Jhurry D. New amphiphilic PEG-b-P(ester-ether) micelles as potential drug nanocarriers. *Journal of Nanoparticle Research*. 2012;14:1168-80.
5. Jeetah R, Bhaw-Luximon A, Jhurry D. Dual encapsulation and controlled delivery of anti-TB drugs from PEG-block-Poly(ester-ether) nanomicelles. *Journal of Nanopharmaceutics and Drug Delivery*. in press.

The role of nanoparticles in genotoxicity and cancer development

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Nanoparticles are now commonly used in commercial products such as sun screens, tires, sport-equipment and toner powder for printing devices. Furthermore, it is anticipated that in future nanoparticles will play a central role in medicine as drug delivery systems. However, the toxicity of

nanoparticles and their mechanisms of interaction with biological systems are not yet well understood. Cell models in vitro represent a useful approach for assessment of the effects of nanoparticles on the human organism and demonstrate cytotoxicity, oxidative stress and inflammatory reaction. Our research is focused on determining the effects of micro- and nanoparticles, e.g. of iron oxide, several metal sulfates and toner particles on DNA and genomic stability, and, consequently, their potential carcinogenicity. As readouts we analyseclastogenic effects using the micronucleus assay (OECD-approved) and the alkaline comet assay. These studies indicate that size and particle composition of nanomaterials can dramatically modify their toxicity.
As there are reports showing that ultrafine particles generated by laser printers cause irritating effects on human mucosa, we determined their potential cytotoxic and gentoxic effects on human lung cells. Our data demonstrated that only few of the devices analysed release ultrafine particles that exhibit DNA-damaging potency, as measured by chromosome damage. Exposure to iron oxide nanoparticles caused oxidative stress and inflammation; however, the molecular mechanisms underlying this activity remained unclear. We demonstrated activation of c-Jun terminal kinase (JNK) and diminished degradation of IkB, resulting in activation of the NFkBsignalling pathway in response to nanoparticle uptake. Interestingly, although ROS formation plays an important role in the genotoxicity of magnetite, the action of JNK is likely to be ROS-independent. This suggests that oxidative stress and inflammatory response are triggered by nanoparticles in the cells by independent mechanisms. Once internalized, nanoparticles can be accumulated in the intracellular compartments, mostly in the lysosomes and multivesicular bodies. The routes of their further delivery outside the cell and transport across the body through the physiological barriers have not been investigated yet. Our hypothesis is that nanoparticles can be shed from the cells and transported in the organism within the extracellular membrane vesicles, referred to as exosomes, and thus reach distant organs, e.g. the brain. Accumulation of nanoparticles in inner organs can lead to chronic effects and cause DNA damage in somatic and resident stem cells. Deregulation of intracellular signalling pathways in combination with chromosome damage might lead to activation of oncogenes and cancer development. However, more evidence about the cellular and molecular mechanisms is required to estimate the hazardous effects of nanoparticles on human health in both the occupational and the ambient environment.

Update on the treatment of breast cancer with HER2 amplification

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HER2 positive breast cancer represents 15% of breast cancers. HER2 family of receptors was discovered in the mid-1980s. There has been a major improvement in the management of this breast cancer subgroup in the 1990s and 2000s.Significant improved prognosis has been noted in this subtype, considered in the past as having poor prognosis. This was mostly related to the development of the first generation anti HER2 monoclonal antibody, trastuzumab, the first targeted therapy in breast cancer that showed improved response rate, progression-free survival, and overall survival in combination with first-line chemotherapy for metastatic breast cancer. Secondarily, the addition of trastuzumab to adjuvant chemotherapy resulted in remarkably early and sustained improvement in disease-free survival and overall survival. As well, the addition of HER2 tyrosine kinase inhibitors, lapatinib, to standard chemotherapy has shown to be superior to standard chemotherapy alone in the metastatic setting.More recently, further improvement has been shown in the metastastic setting by the introduction of pertuzumab which is the second generation anti HER2 monoclonal antibody and similar to trastuzumab. Pertuzumab blocks heterodimerization of HER2 to HER3 antibody and has shown major results. Pertuzumab is able to overcome some pathways of resistance to standard trastuzumab-based therapy. When pertuzumab is combined to standard first-line therapy and trastuzumab, there is improved response rate and progresion free survival and overall survival, with little additional toxicity andthis is practice changing.Trastuzumab-DM1 (T-DM1) is an antibody-drug conjugate, comprised of trastuzumab

covalently bound via a thioether linker to DM1, a derivative of the antimicrotubule chemotherapy maytansanine (targeted chemotherapy).T-DM1 is a new and effective treatment for HER2-positive metastatic breast cancer patients who progress on trastuzumab, with remarkable efficacy and modest toxicity, potentially leading to the limited use of standard chemotherapy in HER2 amplified breast cancers. The next step will be the emergence of new drugs, evaluated for their potential to overcome HER2 treatment resistance. These include the mTOR inhibitor everolimus (BOLERO 3 trial) as well as HER3 monoclonal antibodies, HER1/2 inhibitors such as afatinib, pan-HER inhibitors, PI3K and other combined inhibitors. During the last 15 years, HER2 targeting has modified the natural history of HER2 positive breast cancers. Further significant improvements in outcome are forthcoming with positive impacts on efficacy and toxicity.

Abstracts – Poster Session

Involvement of oxidative stress in the progression of squamous cell carcinoma of the esophagus (SCCE)

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Introduction: Carcinoma of the esophagus is a very common disease in the black communities in Southern Africa. It has become the most common cancer in black men. The etiology remains yet unknown notwithstanding many dietary and biochemical studies. Despite our progress in multimodality therapy, the prognosis for invasive esophageal adenocarcinoma (EAC) and squamous cell carcinoma of the esophagus (SCCE) is poor. This study aimed to demonstrate the implication of oxidative stress in the etiology of SCCE.
Methods and subjects: Thirty patients were recruited from the University Hospital (South Africa) where they are seen for diagnostic endoscopy. Fifteen patients recruited from those undergoing endoscopy for other gastroenterological conditions were considered as controls. Blood samples were collected for biochemical determinations especially those related to the evaluation of oxidative stress: Superoxide Dismutase (SOD), Glutathione peroxidase (GPx), Malonaldialdehyde (MDA), lipid peroxides (LPO), 8-isoprostane (8-IP) and 8-hydroxy-deoxyguanosine (8-OHdg). Using immunohistochemistry techniques SCCE patients were subdivided into three groups according to the histological examination of their esophageal biopsies: moderately differentiated SCCE (MDSCCE: 85%), poorly differentiated SCCE (PDSCCE: 11%) and ulcerating invasive SCCE (UISCC: 4%).
Results: Considering different stages of tumors, a significant increase of LPO (42%) and 8-ISOP (680%) was observed in the MDSCCE group. These data correlated with a decline in SOD activity (164%) in contrast to the slight increase of GPx activity (8%) in the same group. In other two groups (PDSCCE and UISCCE) where a slight increase of GPx (2 % and 4.7% respectively) was observed in contrast with the lowering of SOD activity: 2U/gHb (202%) and 8.8 U/gHb (215%) respectively compared to the mean control (27.8 U/gHb), the level of LPO and 8-ISOP did not significantly change from the mean control (51.5 µM for LPO and 6.9 ng/ml for 8-ISOP). In addition, the histological findings and the immunohistochemistry evidence of DNA damage by the presence in situ (biopsies) of 8-OHdg increasing with the disease progression have provided a consistent correlation between low intake of dietary antioxidant and the occurrence of carcinoma.
Conclusion: Our data on antioxidative stress in oesophageal cancer patients established a correlation between the imbalance of the antioxidant status and the high level of lipid peroxides and 8-isoprostane, the decrease of SOD and the presence in situ of 8-OH-dG as a result of increase of oxidative stress at least at the progression stage to metastasis.

Epidemiological trend of colorectal cancer in Mauritius - A ten year retrospective study

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Introduction: Cancer is a leading cause of death worldwide, accounting for 7.6 million (around 13%) deaths in 2008. Colorectal cancer is one of the important causes of morbidity and mortality throughout the world. Highest incidence rates are found in Australia and Western Europe whereas lowest in Mexico and Africa, Asia. Incidence rate is slightly higher in men than in women. Among the various types of cancer in Mauritius, colorectal cancer has evolved as 1st major type in males and 3rd in females. This study is done to understand the epidemiology of colorectal cancer in Mauritian population.
Methods and Subjects: A retrospective study has been carried out using NCR (NATIONAL CANCER REGISTER) data. It is a population-based record of cancer patients. The sampling was not done. The

study was conducted by analyzing the data of all colorectal patients diagnosed from the year 2001 to 2010 in Mauritius.

Results: Study demonstrates that the high incidence rate of colorectal cancer is pertinent. Age Standardized Incidence Rate (ASR) shows that colorectal cancer is commonest in the age group of 55-74 years with ASR 193-195, followed by 50-54 years with ASR 178, 75-79 years with ASR 152 and 45-49 years with ASR 108. The gender ratio shows the same magnitude of disease in both sexes pertaining to all age groups, and male to female ratio is 1.2:1 ($p=0.028$). Colon is the commonest site of colorectal cancer in all ages and gender groups followed by rectum, with the least incidence in sigmoid colon. Regional distribution shows that of total 1460 cases, the maximum cases 1/3 (i.e. 554) have been recorded without address. In spite of the fact, that Mauritius is a relatively small and well-connected country and also the paradox that, the rural population, which is 47.5% claims only 26% cases ($p<0.01$). This connotes a stigmatization associated with cancer and specifically more so with colorectal cancer therefore, Under-reporting or late reporting of cancer cannot be excluded. Ethnic prevalence signifies that Hindus have not only highest but also rapidly rising incidence rate. General and Sino-Mauritian population have higher percentage of cases than the percentage of their population

Conclusion: The findings of this study emphasizes scope of many more studies to understand the underlying causes and social aspects of epidemiological analysis, which can guide in framing future cancer control action plans, and issues to be addressed through this plan, so as to be able to effectively reduce the burden in Mauritius. NCR is an authentic tool to assess the burden of cancer in Mauritius; and needs to be strengthened. The study highlights the scope and need of introducing screening for colorectal cancer in people past the age of 50 years for early diagnosis and control of the disease in Mauritius.

Estimating the Effects of the Factors Underlying the Progression of Familial Adenomatous Polyposis using Longitudinal Com-Poisson Model

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Familial adenomatous polyposis (FAP) is a genetic disorder affecting the colon and rectum in human beings. This disorder caused by the mutation in APC and/or MUTYH genes leads to hundreds of polyps – the benign growths protruding from mucus membrane, which become evident in the mid teens. If left untreated, the person tends to develop cancer by age 35. The progression of FAP in the affected individuals is monitored by counting the number of polyps developed over a period of time, which in turn depends on several factors: the type of treatment, gender, age and the initial polyp counts being the main ones. It is important to quantify these factors to estimate the extent of disease for its better management and cure. However, the count responses repeatedly observed over time are over-dispersed and highly correlated resulting into a complicated longitudinal count data structure, the analysis of which is quite challenging. To analyze such a structure, we design a statistical model based on Com-Poisson distribution, which is capable of accommodating the complex multidimensional polyps count responses along with the explanatory factors. The model fits the data well. The estimates of over-dispersion as well as correlation parameters confirm the nature of real data. Analysis of the model indicates that males are 50% more at risk to develop polyps than females. With respect to the type of treatment, the application of vitamin C and E with high fiber treatment is a better remedy followed by vitamin C and E only as compared to placebo. In men as well as in women, initial polyp counts positively affect the polyp counts at a given time.

Iodine the ubiquitous nutritional supplement can cause or block thyroid cancer

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Iodine is a trace element that is essential for the synthesis of thyroid hormone. Both chronic iodine deficiency and iodine excess have been associated with hypertrophy and hyperplasia of follicular

cells attributed to excessive secretion of thyroid stimulating hormone (TSH). This may be associated to thyroid cancer risk. Inadequate low iodine intake will result in increased TSH stimulation, increased thyroid cell responsiveness to TSH, increased thyroid cell EGF-induced proliferations, decreased TGFbeta1 production and increased angiogenesis, all phenomena related to promotion of tumor growth. Iodine deficient thyroid cells have an increased content of cAMP and Ca^{+2}, the two major intracellular messengers for TSH. Iodine is a major mediator of thyroid auto-regulation, involving numerous inhibitory actions.

Iodine deficiency causes a high incidence of follicular tumors and that iodine supplementation shifts the distribution towards papillary tumors as observed in Switzerland, Germany and in Austria. Circumstance and conditions which cause iodine deficiency is through suboptimal intake in water and food thus cause increased TSH secretion and have been associated to increased risk of thyroid cancer. Excess intake is associated with iodine-induced hyperthyroidism (IIH) and autoimmune Thyroiditis, due to stimulation of proliferation of thyroid follicular cells and thereby increasing the chances of mutation. Thyroid cancer is a heterogeneous disease that is classified into Differentiated Thyroid Carcinoma (DTC), Anaplastic Thyroid Carcinoma (ATC) and Medullary Thyroid Carcinoma (MTC). DTC and ATC together are classified as Non-Medullary Thyroid Cancer (NMTC). DTC's are the most common histotype (85%), includes papillary (70%) and follicular (15%). Around 20-25% of thyroid medullary carcinomas can be attributed to genetic factors. Germ-line mutations in the RET gene are responsible for the hereditary tumor syndrome. Most of the DTC are slowly progressive and frequently cured with adequate surgical management and radioactive Iodine (^{131}I) ablation therapy (RAI), when detected at an early stage. Metastatic DTC that is untreatable by surgery or refractory to radioactive iodine therapy is associated with poor survival.

An increase in the prevalence of thyroid disease has been found with increasing iodine intake, since universal salt iodization (USI) was instituted throughout China in 1996. The detection rate of TC, papillary thyroid carcinoma (PTC), and medullary thyroid carcinoma (MTC) increased; follicular thyroid carcinoma (FTC) decreased; and that of un-differentiated thyroid carcinoma (UTC) showed no change after USI. The constituent ratio of PTC increased, that of FTC and UTC decreased, and that of MTC showed no change after USI. The mean age of female patients with TC decreased after USI. Thyroidectomies for papillary carcinoma done were 20%, while for follicular carcinoma 36% over 44 years in west Bengal, India. Both total and near total thyroidectomy was done and the survival rate was above 90%.

World Health Organization (WHO) recommended the measurement of urinary iodine as the standard method to assess the dietary intake of iodide by the community. Urinary iodine excretion is a good marker of dietary intake of iodine and is the index of choice for evaluating the degree of iodine deficiency and its correction. Continued supplementation of edible salt fortified with iodine should be monitored carefully and supplementation program should be tailored to a particular region of the globe.

Detecting circulating tumor cells in cancer patients using novel nano-technological methods

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A cancerous tumor sheds small amounts of tumorous cells into its immediate vasculature. Once these cells are in the circulatory system they are called circulating tumor cells (CTCs). CTCs detection helps in early cancer diagnosis, monitoring of therapy while prognosis of cancer, real time tumor biopsy to assess extent of tumor invasion and also in the diagnosis of spread of metastasis of cancer. CTCs are found in extreme low concentrations in blood. This makes CTC isolation, characterization and enrichment difficult. While designing a CTCs isolation system it is imperative that the method should have high capture efficiency (all the CTCs are isolated), high isolation purity (that the isolated CTCs are not mixed with other cells) and have high system throughput (the isolation can be done quickly). High system throughput also sees that a large sample volume can be

processed in a short time.

Initially CTCs were detected in peripheral blood of cancer patients by cytological method, and then by positive immuno-magnetic enrichment method based on frequently expressed surface markers, they can also be detected by reverse transcription polymerase chain reaction (RT-PCR) or immunocytochemistry. These methods had drawbacks regarding sensitivity, sample size, and high false positive reports. Nanotechnology overcomes these disadvantages by using immunomagnetic nanoparticle (NP) enrichment improving CTC separation rates by 1000 to 10,000 times and use of nanoprobe with enhanced fluorescence which is a one-step detection method using flow cytometry. Nanofluidics has been used to test for CTC in ovarian, head and neck cancer and metastatic prostate cancer. Integrated microfluidic system will soon move beyond research to fully functional CTC analysis and create devices and methods, which have clinical application.

It is essential to know, that different cancer types will produce CTCs having different characteristics. So while separating CTCs by microfluidics mechanism the CTCs physical properties should be taken into consideration i.e., size, stiffness, density. Then standardization should be done for particular cancer types. The antigen-antibody bonds used in magnetic labeling, fluorescence labeling and affinity chromatography have produced advantageous results, but there is need to perform comparative studies across cancer types, so that different profiles can be established for different CTCs isolated. Such detailed analysis would reveal information about cancer progression and metastasis and in situ genetic or proteonomic profiling for CTCs can be done without much difficulty. Such novel innovations in Nanotechnology opens new horizons for early identification of cancer and help in close monitoring in cancer treatment arming us with new weapons against cancer and providing new hope in our struggle against cancer.

"Is Oxidative Stress the ultimate risk of the risk factors of Carcinoma Breast"? - A case control study to determine the role of oxidative stress in breast carcinogenesis

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Introduction: Carcinoma breast is an ancient and elusive disease which has claimed its victims in all walks of life in all ages and from time immemorial. Although a number of risk factors have been identified in the causation of carcinoma breast but the mechanisms by which they increase the risk of the disease are still not clear. Oxidative Stress resulting from an imbalance between pro-oxidants and antioxidants seems to play an important role in human breast carcinogenesis. The present study was carried out with an objective to confirm the presence of oxidative stress in patients suffering from carcinoma breast and to prove that oxidative stress has a central role and is the ultimate risk factor of all the risk factors.

Methodology: The study comprised 50 clinically and histopathologically proven breast cancer patients in the age range of 25-55 years. The biochemical estimations carried out in the study were - Serum Superoxide dismutase (SOD), Malondialdehyde (MDA), and Alkaline phosphatase (ALP) levels. The values obtained were compared with age matched equal number of healthy control female subjects from the same population.

Results: Significantly higher levels of pro oxidant MDA ($p<0.001$) and anti oxidant-SOD enzyme levels ($p<0.001$) were found in the patients group in comparison to control subjects, signifying the presence of oxidative imbalance. Variations in these parameters were also observed in all etiologically predisposed subjects such as advancing age, early menarche, and premenopausal subjects, multiparous and in the women taking oral contraceptive pills or hormone replacement therapy. The subjects with positive family history of breast cancer were having although insignificant statistically but higher serum SOD and MDA levels in comparison to subjects who were not having any family history of the disease. Serum Alkaline Phosphatase was found to be significantly higher amongst patients in the advanced state indicating the hepatic involvement.

Conclusion and Recommendations: Breast cancer etiology is multifactorial but the underlying mechanism in each case seems to be oxidative stress directly or indirectly. It is definitely a cause for the development and the progression of breast carcinogenesis. Although genes cannot be modified but oxidative stress is a modifiable risk factor. Simple, economical and easy to perform investigations like serum SOD, MDA and Alkaline phosphatase estimations can detect the predisposition, the presence and the severity of breast carcinogenesis. Early intervention in the form of antioxidants can prevent the onset and can even block the progression of carcinoma breast to ensure a better quality of life.

Postmenopausal metabolic syndrome and the risk of carcinoma breast

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Introduction: Breast cancer is the most common cancer affecting women. The metabolic syndrome (MS), a cluster of metabolic disorders that are the known risk factor of cardiovascular disease and diabetes, has been proposed to play a critical role in the risk and prognosis of breast cancer. Postmenopausal obesity has been linked to many adverse health consequences including the risk of breast and endometrial cancers, insulin resistance, dyslipidemia and diabetes mellitus. The present study was aimed to determine the presence of metabolic syndrome and the associated risk of carcinoma breast in postmenopausal obese women so as to intervene early to prevent the onset or progression of the disease.

Methodology: The study included 100 healthy menopausal women in the age range of 45-60 years selected from the rural and urban population equally. For comparison 100 premenopausal healthy women were also selected in the age range of 25-40 years from the same rural and urban population. All the study subjects were evaluated for Body mass index (BMI), waist to hip ratio (WHR), systolic and diastolic blood pressure measurement, blood glucose, serum uric acid and lipid profile estimations.

Results: A significantly high BMI ($p<0.01$) and a significantly high ($p<0.001$) waist to hip ratio, were observed in the postmenopausal women in comparison to premenopausal women. Most, but not all, studies have confirmed the association between BMI and breast cancer occurrence, recurrence and survival in postmenopausal women. As a commonly used anthropometric indicator for abdominal obesity, WHR has also been evaluated as a critical biomarker for breast cancer survival by a number of studies in recent years. Obesity (high BMI) has been associated with increased estrogen production due to peripheral aromatization of adrenal androgens, which can promote cell proliferation, anti-apoptotic, and proangiogenic effects. Furthermore, obesity, particularly central obesity, could induce chronic low-grade inflammation, which is another known risk factor of breast cancer and can increase the likelihood of epigenetic alterations such as aberrant DNA methylation. Highly significant rise in systolic blood pressure ($p<0.001$) and a significant rise in diastolic blood pressure ($p<0.01$) were observed in the postmenopausal women. Results from both animal models and human studies have implicated that hypertension may increase the response to carcinogens and initiate the process of carcinogenesis. Dyslipidemia, hyperglycemia and hyperuricemia were also observed in the postmenopausal women in comparison to premenopausal women. Chronic hyperinsulinemia, either with or without clinically manifest type-2 diabetes mellitus, is a possible factor favoring cancer progression due to the mitogenic effect of insulin. Higher TG and lower HDL-C levels have been constantly found to be correlated with insulin resistance and type-2 diabetes mellitus and thus adversely affect the prognosis of breast cancer.

Conclusion and Recommendations: Obesity and the tendency for metabolic syndrome sets in with the cessation of menstruation. The biomarkers for each individual component of the MS have been

indicated to be associated with breast cancer survival. It is plausible that the MS is associated with important clinical features of breast cancer and may act as a predictor for breast cancer prognosis. Postmenopausal metabolic syndrome can be prevented and modified by adopting healthy lifestyles; therefore, it is possible to eliminate the risk and improve breast cancer prognosis through taking balanced diet, increasing physical activities and controlling body weight.

Prospective study of the energy balance disruption during adjuvant chemotherapy in post-menopausal early-stage breast cancer patients

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Introduction: In addition to the known prognostic factors for breast cancer (age, tumor size, axillary lymph node involvement, histological type and grade), a high body mass index (BMI) at diagnosis appears to be a factor of poor prognosis. In recent decades, it has been suggested that weight variation, especially weight gain but also weight loss, during adjuvant chemotherapy might be associated to a poor prognosis. A retrospective study of non metastatic breast cancer, recently performed in our comprehensive cancer center, showed that weight change greater than 5% (loss or gain) during chemotherapy increased the risk of relapse (RR=2.24, 95%CI[1.29-3.87]) and death (RR= 1.99, 95%CI[1.17-3.39]) independently of initial BMI. However, weight change during chemotherapy and metabolic changes associated to it, remain unclear. In this context, a prospective study is ongoing including 100 post-menopausal early-stage breast cancer patients to characterize weight variation in particular the variation of body composition and to identify the mechanisms involved.

Methods: Weight variation and various other measurements are taken before and after chemotherapy in post-menopausal early-stage breast cancer patients. A 5% change in body weight is considered as clinically meaningful. Body composition measure (lean body mass, fat and body water) is performed by DEXA and impedancemetry. Energy balance (food consumption *versus* resting energy expenditure and physical activity) is evaluated by food records, indirect calorimetry, and "ArmBand*Bodymedia*®". The factors potentially involved in poor prognosis (e.g.: IGF family, inflammatory markers, adipokines, eostrogen molecule) associated with body composition change are also identified.

Results: To date, 43 patients have completed chemotherapy (mean age: 61 ± 6 years). At baseline, mean body mass index (BMI) was 26.6 ± 5.8 kg/m^2 and 18.6% of women were overweight and 34.9% were obese. However, 58.3% of women presented excess visceral fat (waist circumference > 80 cm) and 83.3% of women had a excess of total body fat mass (> 30% of fat mass). After 6 cycles of chemotherapy (3FEC+3Taxotere®), 20.9% of patients gained weight, 16.3% lost weight and 62.8% of patients remained stable.

Conclusion: This study will bring evidence of the possible causes of weight variation and metabolic factors associated with energy balance disruption potentially responsible for poor prognosis. The understanding of such mechanisms is key to developing strategies for improving the prognosis of early-stage breast cancer patients.

Evaluating Breast Cancer awareness of Mauritian Women (>20 years) using the UK Breast Cancer Awareness measure

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Late presentation of patients at advanced stages of breast cancer is associated with poor prognosis. This delay is due to lack of awareness of the disease. WHO statistics have shown that there is an increased incidence of female breast cancer. Local statistics from the National Cancer Registry reported a significant increase in breast cancer incidence and mortality in recent years. Yet limited studies have focused on its awareness among the female population in Mauritius. This study aims at evaluating the level of breast cancer awareness of Mauritian women using a validated questionnaire and its association with various factors, including age group, marital status, level of education and location. The only validated tool for this task is the UK Breast Cancer Awareness Measure (BCAM). A self-comprehensive questionnaire was designed, which included three main items of BCAM: knowledge of breast cancer symptoms, knowledge of age-related risk and reported frequency of breast checking. Questionnaire survey was carried out by trained interviewers at highly visited areas for one week and a total of 250 females of age more than 20 years were interviewed. Statistical analyses, including Chi-squared test and Pearson's correlation, were carried out using SPSS Version 17 to test for significant differences among the different items of the BCAM and the factors affecting them. 80 out of 250 (32%) participants could not identify any warning signs of breast cancer. Only 21 (8.4%) participants could identify 5 or more non-lump symptoms of breast cancer. Only 2.8% of the participants were aware that a 70-year-old woman was at higher risk of breast cancer compared to the other age group (more than 30 year old, 50 year old or a woman of any age). 33.2 % of the respondents reported breast checking at least once a month or once a week. Statistical analyses revealed that knowledge of non-lump symptoms was age dependent, that is, younger age group was more aware about the different signs and symptoms compared to older ones. There was no significant relationship between knowledge of breast cancer, marital status and location. Level of education and age group were significantly related and were positively correlated with the three-measured BCAM items awareness, such that respondents who reported breast checking at least once a month or once a week were from higher educational level. Level of awareness of breast cancer among females is found to be dependent on education and age group. This tool has not only helped to assess level of awareness but also to identify factors, which influence awareness. Thus we could emphasize on certain means, for example through educational institutions to improve awareness of the population. A future project including the translation of this measure into the local language or the development of breast cancer awareness measure for Mauritius only or all African countries would be an enriching initiative.

Cetuximab in combination with docetaxel (T) in patients with operable, triple negative breast cancer (TNBC): preliminary results of a multicentre neoadjuvant pilot phase II study

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Introduction: Cetuximab is an antibody targeting the epidermal growth factor receptor (EGFR) to which a role has been suggested in Triple Negative Breast Cancer (TNBC). Consequently, we

evaluated the combination of a docetaxel with cetuximab as neoadjuvant therapy of operable TNBC.
Methods: 35 patients with stage II-IIIA disease were prospectively included in this multicentric pilot study. Systemic therapy (ST) consisted of 6 cycles of docetaxel (100 mg/m²) q.3 weeks, in combination with weekly cetuximab (first dose: 400mg/m², then: 250 mg/m²) for 6 cycles. All patients underwent surgery after ST completion. Pathological complete response (pCR) was the primary endpoint according to Sataloff and Chevallier classifications, with toxicity and biologic ancillary studies as secondary endpoints.
Results: Patients characteristics were as follows: mean age 48 [28-67]; T1: 3%, T2: 73%, T3: 24% (mean tumor size: 40 mm [15-100]); N0: 61% and N1-N2: 39%; invasive ductal carcinoma: 100%; Scarff-Bloom-Richardson Grade III: 73%, grade II: 27%. The median number of cycles was: T : 6 [1-6], cetuximab: 15 [1-18]. Pathological complete response was 24% according to Chevallier and Sataloff classifications and 28% if we consider response in breast. Preliminary results on 23 patients show an overall clinical response rate of 57% (22% CR). Conservative surgery was performed in 75% of cases. Skin toxicity was the main side-effect: grade II: 39%, grade III: 36%, grade IV: 3%. Neutropenia grade IV: 12.7%, febrile neutropenia: 1.3%, infection: 0%. Hand-foot syndrome grade III: 3%, grade II: 3%. Ungueal toxicity grade III: 3%, grade II: 33%.
Conclusions: These preliminary results suggest that cetuximab in combination with T appears to have a moderate efficacy in operable TNBC. Further biological studies will explore potential biomarkers predicting chemosensitivity of chemoresistance to this therapeutic regimen.

Is it possible to predict the efficacy of a combination of Panitumumab plus FEC 100 followed by docetaxel (T) for patients with triple negative breast cancer (TNBC)? Final biomarker results from a phase II neoadjuvant trial

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Introduction: TNBC is a heterogeneous group of tumors for some of which the Epithelial Growth Factor Receptor pathway (EGFR) may play an important role. We evaluated the efficacy and toxicity of an anti-EGFR antibody (panitumumab) combined with a standard neoadjuvant chemotherapy in order to identify predictive biomarkers of efficacy and target biologically defined subpopulations for potential further development.
Methods: Sixty patients with stage II-IIIA disease were prospectively included in this multicentricneoadjuvant study. Systemic therapy (ST) consisted of the anti-EGFR antibody panitumumab (9 mg/kg q.3 weeks x8) combined with FEC100 (500/100/500 mg/m2 q.3 weeks x4) followed by 4 cycles of docetaxel (100 mg/m2 q.3 weeks x4). All patients underwent surgery after ST completion. Patients characteristics were as follows: mean age 50 [27-72]; median tumor size 40 mm [20-120] ; invasive ductal carcinoma 96.7% ; Scarff-Bloom-Richardson Grade III : 71.7%, grade II : 28.3%. Pathological complete response (pCR) rate was 52.3% [95% IC: 37.3-67.5] (Sataloff classification) and 46.7% [95% IC: 31.6-61.4] (Chevallier classification). Conservative surgery was performed in 88% of cases. Skin toxicity was the main side effect (grade IV: 5%, grade III: 30%, grade II: 20%). Neutropenia grade IV: 27%; febrile neutropenia: 5%. Infection: 0%. Hand-foot syndrome

grade III: 3.3%. Ungueal toxicity grade III: 1.6%, grade II: 20%. Paraffin-embedded and frozen samples were systematically collected before and after ST for biologic studies. Germinal *BRCA1* mutations, *EGFR*, *KRAS*, *BRAF* and *PI3KCA* somatic mutations were analyzed by sequencing. EGFR, IGF-1R, MET, cytokeratins 5/6 and 8/18, PTEN, P-cadherin, ALDH1, Ki-67, p53, tumoral FOXP3 expression and the number of FOXP3+ or CD8+ tumor-infiltrating lymphocytes (TILs) were evaluated by IHC.

Results: Sequencing revealed BRCA1 mutations in 10% of patients. No pCR rate difference was observed between mutated and non-mutated patients. Somatic mutations of PI3K were observed in 6 patients. No mutations were observed in BRAF, KRAS, or EGFR. Immunohistochemistry results show that majority of tumors have more than 40% of positive cells for Ki-67 (83.9%) and present a score for EGFR greater than 70 (58%). These characteristics were found to be predictive for pCR according to a receiver operating characteristic (ROC) curve analysis (p=0.06). About half of the tumors express cytokeratin 5-6 and p53 (cut off: 1%). Chi-squared tests were performed to assess relations between cutaneous toxicities and pCR but no correlation was found (p=0.94) as well as with Ki-67, EGFR, Cytokeratin 5-6 and p53. Interestingly, high CD8+ TILs was response-predictive (p=3.4.10-6). Tumor FOXP3 expression and high FOXP3 TILs tended to be predictive. High IGF-1R expressors responded better than low expressors (p=0.028). Comparison of EGFR, IGF-1R and HER3 in biopsies vs surgical samples showed reduced EGFR levels in non-responders (p = 0.037), while HER3 (p = 0.049) and IGF-1R (p = 0.08) increased.

Conclusions: The CD8+ TIL count seems to predict the response to panitumumab. Tumor FOXP3 expression and high FOXP3 TILs also tended to be predictive. Tumor levels of IGF-1R seem to play a determinant role in TNBC response to anti-EGFR antibodies, in concordance with our observations in a head-and-neck cancer cohort.

Mauritian Male's knowledge about female breast Cancer

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Breast cancer is considered to be the most common form of cancer affecting women worldwide. It has also the highest cancer-related mortality rate among women due to lack of awareness and late diagnosis at advanced stages. The recent increase in breast cancer incidence in Mauritius requires rapid action in term of increasing awareness of the population, including both male and female. Since the disease does not directly affect male, they are very often neglected in awareness campaigns and surveys in Mauritius. This study aims at investigating male's knowledge on breast cancer through a questionnaire survey. It included knowledge on signs and symptoms; causes of breast cancer and these were correlated with factors, such as age group, level of education, marital status and location. Questionnaire survey was carried out at highly frequented places and a total of 250 males were interviewed Data was computed and analyzed using SPSS version 17. For each symptoms and each risk factors identified one (1) mark was given. The score for each participant was calculated. The scores were then categorized into 3 groups: Poor awareness (0-7), Average awareness (8-15) and Good awareness (16-23).Chi-squared test and Pearson's correlation were carried out to test for significant differences among the measured parameters. This study revealed that 80.4% of the respondents were low awareness about breast cancer. 57.2% of the male was not aware of the signs and symptoms of the disease while 37.6% reported being unaware of the risk factors. Pain and presence of lump were the common signs and symptoms recognized by male respondents while family history, cigarette smoking, exposure to radiation and no breastfeeding were identified as the main causes. Statistical analyses revealed no significant relationship between level of awareness and marital status. Although there was no significant relationship between level of awareness and location, participants from rural areas were less aware about the disease. However, level of awareness was significantly related with age and level of education. Awareness level was negatively correlated with age while it was positively correlated with level of education, implying that younger and more qualified participants had higher awareness level. Thus education is

a key factor in the dissemination of information regarding breast cancer in Mauritius and may explain the higher level of awareness among younger participants since they are more exposed to this information at an earlier stage, probably through media and/or at school. This implies that the local education system is somehow helping to increase the level breast cancer awareness among Mauritian's male. However, further studies need to be done to determine ways that could promote the dissemination of information and find means to sensitize the population on breast cancer.

Mauritian Female's (>20 years) knowledge of breast cancer and Breast Awareness practices

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Lack of knowledge on breast cancer leads to delay in presentation of patients, which is associated with low survival rate. This explains the increasing incidence of the disease worldwide and in Mauritius. Still there have been hardly few studies, which have, try to evaluate the knowledge of the female about this pathology. The aim of this study was to assess the knowledge of Mauritian female about breast cancer and breast cancer awareness practices. A questionnaire was designed consisting of three main sections: i) Knowledge on warning sign, ii) knowledge of risk factors & iii) breast awareness practices. Trained interviewers posted in highly frequented places and interviewed 250 females aged 20 and above. Statistical analyses, including descriptive statistics and Pearson's correlation, were carried out using SPSS Version 17 to test for significant differences among the different part of the questionnaire and the factors affecting them. 80 out of 250 (32%) participants could not identify any warning signs of breast cancer and 81 out of 250 (37.6%) participants could not identify any warning signs of breast cancer. Pain in breast or armpit (42.8%) and lump or thickening in the breast (39.2%) were the warnings signs, which were identified most. The respondents considered family history (43.2%), cigarette smoking (28.4%) and no breastfeeding (39.2%) were risk factors contributing to breast cancer. 17.6% of respondents claim that they checked their breast at least once a month and 15.6% at least once a week. Nearly Half the participants (48%) said that they never checked their breasts while 34.4% checked themselves last week or last month. 64.8% females were either not confident at all or slightly confident to find a change in their breasts while only 11% were very confident. 6.4% of the participants said that they shall not tell anyone if they found changes in their breasts. Husband/partner is the one to whom most of the females (69.6%) would tell if they found any changes in breasts. Knowledge of risk factors and/or symptoms was found to be very poor. A great proportion of Mauritians female are not breast aware. Further works would lay emphasis on improving the knowledge of the female and how to encourage them to practice breast awareness. Ultimately this will encourage them to present to a physician as soon as they notice something unusual.

Gastrointestnal stromal tumour (GIST) - A case report and GIST as an example for molecular diagnosis and targeted molecular therapy for cancer

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Introduction: Gastrointestinal stromal tumors (GISTs) account for 80% of all mesenchymal tumors in the gastrointestinal tract (GIT) and less than 1% of all gastrointestinal tumors[1]. GISTs have been in the limelight in the cancer community for the past three decades because discoveries about molecular mutations such as in receptor tyrosine kinase have had major implications; it has resulted in targeted molecular therapy such as imatinibmesylate, which has significantly changed the outcome of these tumors. In this article we describe a clinical case of a patient found to have GIST.
Case Details: A 62-year-old gentleman presented to the hospital with severe colicky pain in the upper abdomen, bloating and vomiting for the past 12 hours. For the past 4 months he had been

developing discomfort with solid foods, which led to his diet primarily consisting of liquids. His abdomen was soft, with distension and tenderness in the epigastrium and both hypochondria. A 7 by 8 centimeter firm, fixed and irregular mass was palpable in the right medial and lower hypochondrium. Rest of the examination was normal. The patient was admitted with a working diagnosis of acute upper intestinal obstruction with a mass of undetermined nature. His blood test result was significant for hemoglobin of 11.5 g/dL and serum sodium was 127 mmol/L. His blood urea nitrogen, serum creatinine, serum bilirubin and liver function tests were normal. Abdominal ultrasound showed a large mass in the upper jejunal region of the intestines causing partial obstruction of the duodenum. A month ago the patient had undergone an esophagoduodenoscopy down to the first part of the duodenum, which revealed no abnormalities. A CT scan of the abdomen displayed almost complete obstruction of the distal duodenum suggestive of a luminal mass causing gross dilatation of the proximal duodenum and stomach. A laparotomy was performed with the following findings: A 9 by 10 centimeter grayish white mass was found adherent to the second and third parts of the duodenum, pancreas, aorta and inferior vena cava. The exact origin of the mass was uncertain but the surgeon felt that it was arising from the duodenum. Owing to its friability and adherence to large blood vessels, the tumor proved to be unresectable and a palliative gastrojejunostomy was carried out after biopsy. The histopathological report of the mass showed a tumor that was composed of spindle shaped cells with stroma showing vascularisation with some other less differentiated tissues, which were presumed to be derivatives of mesenchyme. This suggested a diagnosis of GIST.

Conclusion: Most GISTs harbour the activating KIT mutation. Another common mutation is the PDGFRA (Platelet Derived Growth Factor Alpha) mutation. Both KIT and PDGFRA are members of the transmembrane receptor tyrosine kinase family. Therapies against mutational tyrosine kinase with drugs such as imatinib and sunitinib have improved the prognosis even in inoperable and metastatic cases. GISTs bear witness to the evolution of oncology beyond histopathological parameters, towards a molecular definition of cancer. The field of cancer genomics is very active currently and it is hoped that the positive experience with GISTs can be translated to other cancers, leading to more effective targeted molecular therapy.

Reference

1. Zhao X, Yue C. Gastrointestinal stromal tumor. *J Gastrointestinal Oncol*. 2012;3(3):189-208

Epidemiological trends of prostate cancer in the Republic of Mauritius over past two decades

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Background: Cancer affects women more than men in Mauritius. However, amongst cancer sites involving males, prostate cancer is on the rise and its burden is expected to increase with aging of the population. The objective is this study is to analyze incidence and mortality data, and to conduct a survival study on prostate in Mauritius.

Methodology: Prostate cancer incidence data was retrieved from our National Cancer Registry, which is operational since 1989 and has reached population-based (PBCR) level as from 2001. Distribution by age, ethnic group mortality data due to prostate cancer have been obtained from civil status office. A five-year population based survival study on prostate cancer registered in 2005 was also carried out.

Results: During 1989-2010, 1087 new cases of prostate cancer have been registered in the Republic of Mauritius. ASRW incidence rates have risen from $4.6/10^5$ for 1989-1990 to $16.9/10^5$ for 2009-2010. It represents the second most common site in males (11.1%) after colorectal cancer (13.3%) and ahead of lung cancer (9.5%). As regards ethnic groups, the incidence rate of prostate cancer is higher in sino-mauritian and the general population compared to Hindus and Muslim ($p = 0.05$). It is also more common in urban areas (Expected/Observed Ratio i.e. EOR is 1.38) compared to rural

ones (EOR = 0.73). Mortality ratio has steadily decreased from 0.82 in 1997-2000 to 0.69 in 2009-2010. Population based five year survival rate for cases registered in 2005 (N = 61) was 65.6% overall and 70.3% cause specific. Patients with a pre-therapeutic PSA level <50mg/ml showed a better 5-year survival rate (76%) compared to those ≥50mg/ml (42%) P = 0.005.
Conclusion: The significant increase in prostate cancer incidence in Mauritius mirrors the trends seen in other sites like colorectal cancer in both sexes and female breast and endometrial cancer, and warrants adequate preventive, curative and palliative strategies for better cancer control.

The diagnostic and treatment journey of patients following breast and cervical cancer screening at the Link of Life Cancer Support for the period January 2012 – December 2012

Tanuja Poorun, Shashi Desai
Link of Life Cancer Support Center, Vacoas, Mauritius

The Link of Life Cancer Support Center is a non-governmental organization, which offers free breast and cervical cancer screening to women on appointment by a qualified female doctor twice a month on its premises in Vacoas. Screening of breast and cervical cancer first started in October 2009 and April 2011 respectively. Breast screening is done by physical examination and cervical screening is done using the Visual Inspection Acetic Acid (VIA) method with further examination by colposcope. For abnormalities detected during screening, the patient is referred to the surgery or gynecology unit at Victoria Hospital for further investigation. The aim of this study was to follow up on those patients who were referred for further investigation following breast and cervical cancer screening for the period January 2012 – December 2012 from the Link of Life Cancer Support Center. Seventy-one (71) female respondents (37 and 34 referred cases following breast and cervical screening respectively) were interviewed via the telephone using semi-structured questions. Results show that there was a high incidence of non-compliance with medical follow-up after respondents were encouraged to continue further investigations following abnormal cancer screening results. Possible causes for this behavior are identified. This study highlights the need to further investigate the perceptions, knowledge and behavioral practice of Mauritian women regarding breast and cervical cancer screening, which may lead to nation-wide strategies to lessen the taboo surrounding cancer in Mauritius and increase patients' compliance to cancer diagnosis and treatment.

Announcement: A new journal of IAMBR-SFRR Africa

Archives of Medical and Biomedical Research

Home page: http://www.iambr.info/AMBR/

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The article-processing fee will be waived to all the authors who contribute to the inaugural issue (January 2014).

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