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Posters

Kwang Il Park, Transl Med 2016, 6:4(Suppl)
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Phospholipase Cγ1 links inflammation and tumorigenesis in colitis-associated cancer

Kwangil Park
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Colorectal cancer is linked to inflammation and phospholipase C 1 (PLC γ1) is associated with tumorigenesis and the development of colorectal cancer; however, evidence of mechanisms connecting them remains unclear. Here we found that PLC γ1 regulated colitis and tumorigenesis in intestinal epithelial cells (IEC). In a colitis-associated cancer model, we showed that the deletion of PLC γ1 in IEC decreased the incidence of tumors by enhancing apoptosis and inhibiting proliferation during tumor development. Accordingly, the deletion of PLC γ1 in IEC reduced colitis-induced epithelial inflammation via inhibition of pro-inflammatory cytokines and mediators. The PLC γ1 pathway in IEC accelerated colitis-induced epithelial damage via regulation of tight junction (TJ) proteins. Our findings suggest that PLC γ1 is a critical regulator of colitis and colorectal cancer and could further help in the development of therapy for colitis-associated cancer.

Biography

Kwangil Park has been conducted the "An effect of anti-inflammatory and anti-cancer by natural products". He investigated the compounds and extract isolated from natural products modulate on transcription and translation pathway, and using the mechanism underlying its action.

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Notes:

Nadia Batawil, Transl Med 2016, 6:4(Suppl)
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Papillary thyroid cancer with bilateral adrenal metastases

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Background: Papillary thyroid cancer is the most common type of thyroid malignancy and has an excellent prognosis. Distant organ metastasis is rare. Bilateral adrenal metastases with avid iodine uptake have not been described before.

Patient Findings: A 47-year-old woman presented for evaluation because of a severe right upper arm pain and weakness. Magnetic resonance imaging of the thoracic spine showed a compression fracture at the third thoracic vertebra associated with a soft tissue mass. Computed tomography (CT) with CT-guided biopsy of the mass showed metastatic papillary thyroid carcinoma. Ultrasonography of the neck showed an enlarged right thyroid lobe with cervical lymphadenopathy. A high resolution CT scan of the chest showed multiple bilateral pulmonary nodules. Treatment included total thyroidectomy and lymph node dissection; external beam radiation to the thoracic spine; and iodine 131 therapy. Initial whole body iodine 131 scintigraphy showed faint uptake at the right upper abdomen, interpreted as a sign of physiologic bowel activity; however, repeat whole body iodine 131 scintigraphy showed increased uptake at both adrenal glands, consistent with metastatic disease. Serial abdominal CT scans showed progressively enlarging bilateral adrenal masses. Despite additional treatment with iodine 131, the patient's disease deteriorated and progressed at all metastatic sites.

Summary: This patient had bilateral adrenal metastases from advanced papillary thyroid cancer with distant metastasis to lung and bone at initial presentation and poor response to multiple iodine 131 therapy. Unilateral adrenal metastasis from thyroid cancer has been described previously in 6 cases; however, this is the first case report of bilateral adrenal metastasis.

Conclusions: Bilateral adrenal metastasis is rare in papillary thyroid cancer. Elevated abdominal uptake of iodine 131 in a high risk patient may be a sign of abdominal metastatic disease.

Biography

Nadia Batawil is Associate Professor and Consultant of Nuclear Medicine at King Abdulaziz University, Jeddah, Saudi Arabia. She pursued her Nuclear Medicine Residency Training and her Fellowship in Clinical and Research Nuclear Cardiology, at University of Alberta, Edmonton, and University of Toronto, Canada December 2000. In 2006, she did 1 year of clinical attachment PET/CT, at Sanatorium Hospital, Hong Kong. She has an interest in clinical research with multiple publications in nuclear medicine. She is a Member of the Society of Nuclear Medicine and European Association of Nuclear Medicine.

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Notes:

Bing Zhu, Transl Med 2016, 6:4(Suppl)
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Activated hepatic stellate cells promote angiogenesis via interleukin-8 in hepatocellular carcinoma

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Background: Chemokines have been recognized as important modulators of angiogenesis and they play critical roles in the development and metastasis of hepatocellular carcinoma (HCC), although their origins and latent molecular mechanisms remain elusive.

Aim: The aim of this study was to investigate how activated hepatic stellate cells (a-HSCs) promote angiogenesis in HCC.

Methods: A total of 22 HCC patients were enrolled randomly. We used immunohistochemistry; western blotting and enzyme-linked immunosorbent assay (ELISA) to analyze the production of interleukin-8 (IL-8) in a-HSCs derived from HCC tissues. The angiogenic effects of IL-8 in vitro and in vivo were assessed by ELISA, real-time quantitative polymerase chain reaction, capillary tube formation assay and chick embryo chorioallantoic membrane assay.

Results: The present study showed that IL-8 was enriched predominantly in the tumor stroma of HCC tissues and was mainly derived from a-HSCs, rather than from hepatoma cells, in vivo and in vitro. Angiogenesis was most active at the invading edge, which was close to the a-HSCs. The angiogenic effect was dramatically attenuated by an IL-8 neutralizing antibody both in vitro and in vivo. Moreover, the IL-8 neutralizing antibody down-regulated Ser727-phosphorylated STAT3 levels in hepatoma cells treated with a-HSCs conditioned medium.

Conclusions: These findings reveal that a-HSCs within the stroma of HCC contribute to tumor angiogenesis via IL-8.

Biography

Bing Zhu is a Doctor and has more than 10 years of experience in General Surgery department. He has completed his PhD from Zhongshan University's third affiliated hospital. Currently, his major directions of research are Tumor Angiogenesis.

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Notes:

Mahsa Vahdatian et al., Transl Med 2016, 6:4(Suppl)
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Head and neck (H&N) squamous cell cancer adapted to high levels of nitric oxide (NO) causes down regulation of condensin complex I protein in (SCC)

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Hypothesis: In head and neck epithelial cell lines down regulation of condensin complex I gene, NCAPD2, promotes carcinogenesis.

Objective: Carcinogenesis is a multi-factorial phenomenon, including abnormal changes or functioning in genes responsible for appropriate cell cycle regulation. There are many free radicals by product produced by all cells of the human body including NO. NO helps in communication and transmission of signals throughout the body. Down regulation of many important mitotic regulator genes involved in cell cycle regulation is observed in cell lines those are exposed and have accordingly adapted to high levels of NO, thereby leading to chromosomal instability (CIN). NCAPD2 is one such gene that encodes for condensing complex I, which plays a crucial role in proper condensation, and segregation of chromosomes in addition to supporting genome stability, cell differentiation and development. To understand the relationship between increased NO levels and any metastatic potential, five H&N SCC cell lines were subjected to high levels of NO. After adaption to the high NO levels, NCAPD2 gene was observed to be down regulated in these cell lines.

Method: In this experiment, five pairs of H&N cell lines (parent and cancer cell lines) were studied: SCC016, SCC040, SCC056, SCC114, and SCC116. The bioinformatics resources were retrieved from DAVID and the provided data for the cell lines were studied. The genes causing any types of defect in cell cycle processes were noted and it was found that the cell cycle process is interrupted by down regulation of many genes among head and neck cell lines. These genes were separated, and analysis was completed for the down regulated genes, using Blue J, a comparative gene program.

Results: In head and neck cell lines, after comparing all down regulated genes, NCAPD2 was the one common gene correlated with cell cycle processes which possibly promoted tumorigenesis.

Conclusion: Decreased expression of NCAPD2, which is an important mitotic regulator gene involved in cell differentiation and development, is found when exposure and adaptation of H&N SCC cell lines are done in high levels of NO. An observable correlation is found between high levels of NO and its effect on aggressive or metastatic cancer cell lines, where down regulation of NCAPD2 leads to CIN. Further studies involving varying levels of NO and its effects on other such similar genes will warrant a better understanding on the subject matter.

Biography

Mahsa Vahdatian has achieved her Bachelor's degree from the University of Illinois, Chicago, IL in Biological Sciences. She joined the Oncology Research Lab of Dr. James Radosevich at UIC College of Dentistry and started her research on the effects of Nitric Oxide (NO) on cancer cell lines and has numerous abstracts published in many major journals such as Tumor Biology. She was on the organizing committee of the 43rd ISOBM annual conference held during September, 2016 in Chicago, IL and is currently a Board Member of Oncomarks.org, which is an online scientific research related source for individuals in the field of medicine. Additionally, she is also a Member of the ISOBM organization. She is actively interested in Oncology-related research programs especially in the fields of Immune System response to brain injuries, function and role of microglial cells during CNS injuries, and effects of nitric oxide on down/up regulations of genes leading tumorigenesis.

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Notes:

Ravikant Bhaskar et al., Transl Med 2016, 6:4(Suppl)
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Upregulation of JUN, FOS & AP1 in head and neck cancer cells upon exposure to high nitric acid (NO) environment

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Objectives: When subjected to high concentration of NO, H&N tumor cell express more aggressive phenotype compared to non-exposed cell. Upon exposure these cells exhibit adaptation causing greater metastatic potential. Currently, little is known about the process how these NO exposed cancer cells acquire such an aggressive phenotype. In order to mimic the clinical findings, five H&N cell lines were adapted to high concentrations of NO. It appears that AP1, which is a transcription factor protein, composed of JUN and FOS family proteins. These proteins are responsible for various cellular process including cell differentiation, proliferation and apoptosis which up regulate these cells. Jun codes for c-Jun, a proto-oncogene, which has been implicated in aggressive breast and lung cancer cells.

Methods: This study used five human H&N cells lines (SSC-016, SSC-040, SSC-056, SSC-114, and SSC-116). Slow exposure of high NO was used on the cell lines to increase quantities of DETA-NONOate (NO donor). Both the parent and NO cell lines were tagged with red/green fluorescent markers and mRNA was isolated. A gene chip analysis was used to assess genome wide gene expression. Via scratch assays cell migration rates were assessed. Within these five cell lines JUN, FOS, and AP1 genes were up-regulated when exposed to high NO. Increased migration velocities were demonstrated among all three genes.

Results: In the five cell lines JUN, FOS and AP1 genes were up-regulated. Compared to the parent cell lines, an increased migration velocity was observed.

Conclusions: Results indicated that exposure to high levels of NO results in up-regulation of JUN, FOS, and AP1 in human H&N cell lines (SSC-016, SSC-040, SSC-056, SSC-114, and SSC-116). Within these cell lines JUN, FOS, and AP1 genes had an increased migration velocities which demonstrated an increased tumor aggressiveness.

Biography

Ravi Kant Bhaskar has completed his Medical degree from Calcutta University in India. He has been working as a Medical Practitioner in Delhi, India for past few years. He has worked in various capacities as Medical Practitioner from Private Hospitals to Government dispensaries and Hospitals and possesses a good experience as Clinician. He recently moved to USA with an aim to join Internal Medicine Residency Program. He volunteered in the 43rd ISOBM annual conference, September 2016 held in Chicago, which was attended by very well established medical scientists and other scientists working in the field of oncology from all over the world.

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Umar Ahmad et al., Transl Med 2016, 6:4(Suppl)
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High nitric oxide-adapted breast cancer cell lines showed down-regulation in cell division cycle protein 27 (CDC27)

Umar Ahmad, Juel Chowdhury[1], Mahsa Vahdatian[1], Narmatha Kennet, Hani Pharaon, Kamsika Uthayaseela, John Thomas and **James A Radosevich[1, 2]**
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Hypothesis: High nitric oxide (NO) causes adaptation in breast cancer cell lines which results in decreased expression of genes involved in the cell cycle arrest.

Objectives: Unregulated progression of a cell through its cell cycle is a prime characteristic of cancer. Observation demonstrated that adaptation to high concentration NO (HNO) caused the decreased expression of crucial genes necessary for cell cycle regulation. One such gene in the comparative observation between the affected cells lines (HNO cancer cells) and the parent cell lines reveal that expression of the CDC27 gene was evidently decreased in HNO cancer cells (breast cancer cell lines). CDC27 functions to provide a subunit of the APC/C (anaphase-promoting complex/cyclosome) which is essential for keeping the spindle checkpoint in order.

Methods: Three breast cell lines were exposed to HNO using DETA-NONOate (a NO donor) namely: Hs578t, MCF7, and T47D. Constant exposure to HNO led to adaptation of the cell lines. Expression levels between the HNO cancer cell lines and parent cell lines (control) were evaluated by a genome-wide gene chip experiment.

Results: In the HNO adapted breast cancer cell lines Hs578t, MCF7, T47D and T47D, CDC27 gene was down-regulated.

Conclusions: Decreased Expression resulted in the CDC27 gene of breast cancer cell lines when exposed to HNO in contrast to the parent cell lines. High level of NO led to different expression of CDC27 which may prove to be beneficiary in understanding its effect on cell growth when compared to their parent cell lines. Further exploration is needed in the effects of nitric oxide on cell proliferation and the varying expression levels of other genes.

Biography

Umar Ahmad is a Medical student from New York. He started his medical education by doing pre-med in the Dominican Republic in Spanish. From there, he went to Medical school in the Caribbean. He is currently in Chicago working with some of the best doctors in the US. Currently, he is learning to combine clinical skills, doctor's experience, hospital protocols, and ethics.

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Notes:

Karla Licona et al., Transl Med 2016, 6:4(Suppl)
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Tumor cells adapted to high nitric oxide ensure survival by up or down regulating specific genes within the apoptosis pathway

Karla Licona, Khatja Batool[1], Juel Chowdhury[1], Ghassan Jibawi, Ravikant Bhaskar and **James A Radosevich[1,2]**
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Hypothesis: High nitric oxide (HNO) adapted squamous, lung, breast tumor cells show up or down regulation in multiple steps of apoptosis pathway and prevent apoptosis from occurring.

Objectives: Apoptosis is an ATP dependent programmed cell death through which our bodies remove damaged cells. One of the pathways of apoptosis involves apoptosis-inducing factor (AIF), a protein that triggers chromatin condensation and DNA fragmentation in a cell in order to induce programmed cell death. It has been observed that nitric oxide (NO) plays a significant role in a patient's clinical outcome where patients with lower NO levels have a better clinical outcome compared with higher levels. This may be explained by the role of the AIF gene in suspension of the apoptosis pathway. The IκBα gene which is found in the apoptosis pathway regulates the NF-κB gene and this allows for generation of anti-oxidants. NF-κB gene activation can also play a role in furthering the expression of high nitric oxide cells. To better understand the effects of NO, our laboratory studied a cell line system of both HNO-adapted and parent cell lines via a gene chip analysis.

Methods: In human breast adenocarcinoma, four pairs of parent/HNO cell lines (MCF7, Hs578t, T47D, BT20) and five parent/HNO pairs (SCC016, SCC040, SCC056, SCC114, and SCC116) of squamous cell carcinoma cell lines, and one pair (A549) of human lung adenocarcinoma cell lines were tested in a gene chip experiment. This experiment involved dying cell lines green, the HNO cell lines, or red, the parent cell lines, within a microarray plate. The cell lines showed a magnitude of up-regulation (green) or down-regulation (red) of all genes in the human genome in these tumor cells.

Results: In squamous cell carcinoma cell lines (SCC016, SCC040, SCC056, SCC114, and SCC116), it was discovered that the Apoptosis Inducing Factor (AIF) gene was commonly down-regulated. Additionally, the IκBα gene was found to be commonly up-regulated in all the adenocarcinoma cell lines (MCF7, Hs578t, T47D, BT20, and A549).

Conclusions: These results suggest that the adaptation of squamous carcinoma cells to increased levels of NO leads to down regulation of the AIF flavoprotein thus prolonging the lifespan of the malignant cell and allowing further damage. In addition, the up-regulation of the IκBα gene deactivates the NF-κB gene and prevents the formation of anti-oxidants that reduce the damage caused by high levels of Nitric Oxide.

Biography

Karla Licona is an MPH and MD student. She received her Bachelor's in Science with a major in Health Education and Nutrition from California State University of Northridge. After graduating, she attended Saint James School of Medicine and is now currently completing her MPH degree with two certificates in Epidemiology and Healthcare Management and Policies from Benedictine University, Chicago. She completed research on the topic of HPV Vaccine Gardasil which has been lagging usage in the United States among college students. This year she participated as Organizing Committee Member for International Society of Oncology and Biomarkers (ISOBM)-2016 which was held in Chicago. Currently, she is a Board Member for Oncomarks.org, an online professional network which allows open access to journals for students and those interested in research. Her research interests are: HPV related cancers (cervical, penile, vulvar, anal and oropharyngeal cancers) and nitric oxide effects in the tumor environment.

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Madhusudan Patel et al., Transl Med 2016, 6:4(Suppl)
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Increased Nitric Oxide (NO) exposure in pseudogenes may play a role in cancer stem cell formation

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Hypothesis: The high exposure of CeRNA and microRNA to HNO effects the pseudogenes and the coding along causing their over expression in cancer cells.

Objective: Evidence regarding pseudogenes being functional have recently emerged. MicroRNA isolation due to CeRNA adds to pseudogenes and their influence on the growth of cancer. One well studied gene is the BRAF pseudogene and its functional BRAF gene. Studies have shown that high levels of the BRAF pseudogene are directly proportional to the formation of aggressive malignancies.

Methods: Gene chip analysis of ten HNO adapted cell lines (Squamous cells: SCC-016, SCC-040, SCC-056, SCC-114, SCC-116; Adenocarcinomas: A549, BT20, Hs578, MCF7, and T47D) was carried out. Known pseudogenes were identified in each line, as well as their coding counterparts.

Results: The adenocarcinoma cell lines *RP6-159A1.2, RP11-255N24.3, AC004490.1, LDHBP, RP11-572H4.2* were down regulated pseudogenes, and there were no up regulated pseudogenes. The squamous cell carcinomas (SCCs) had the following up regulated pseudogenes: *RPL37AP1, AC138972.1, RP11-641D5.1, AC005534.6, AC022431.1, RPL26P12*, and they had these down regulated pseudogenes: *RP6-159A1.2, RP11-255N24.3, RBMXP1, RP11-20O23.1, RP11-551G24.2*. All cell lines followed the hypothesis, showing an increase in a pseudogene expression indicating an increase in the corresponding gene (with the exception of the adenocarcinoma cell lines).

Conclusions: The high concentration of CeRNA may reduce expressions of microRNA, which would then lead to high concentrations of pseudogenes (likely due to high levels of HNO). Pseudogenes, along with BRAF, in turn reduce the expression of microRNA. Therefore, the pseudogenes and BRAF take the same role as the CeRNA. This results in a feedback loop of over expression of the coding gene.

Biography

Madhusudan Patel is a Medical Doctor from Gujarat, India who began his medical education at University of Seychelles - American Institute of Medicine and graduated in 2013. He travelled to UAE, Seychelles, Mauritius and India for clinical exposure, throughout his medical education. After moving to the United States, he has actively pursued his medical education with many established doctors. He volunteered at the 43rd ISOBM Annual Conference held during September, 2016 in Chicago, IL, which was attended by established academics such as Dr. Ferid Murad and Dr. Robert Winn. Recently, he has enthusiastically started developing his skills in medical research and is a Board Member of Oncomarks.org where he is working towards helping other people who share similar fields of interest. He is a very passionate medical doctor who aims to acquire a position in Internal Medicine residency program and is actively working towards stretching his academic boundaries.

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Juel Chowdhury et al., Transl Med 2016, 6:4(Suppl)
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In Adenocarcinomas (ACs) high Nitric Oxide (HNO) leads to adaptation of Tumor Stem Cell (TSC)

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Hypothesis: Adaptation of adenocarcinomas (ACs) after exposure to consistently high concentrations of Nitric Oxide (NO) after adaptation evokes a transformation to an aggressively physical composition identical to cancer stem cells. This is owed to the varying expression of specific biochemical pathways, in particular, cellular respiration being altered.

Objective: Cells modified to large concentrations of High Nitric Oxide (HNO) portray a more vigorous phenotype of AC homologous to cancer stem cells in contrast to non-modified cells. The exact molecular and cellular mechanisms that occur during HNO exposure are not fully understood. Further knowledge of these mechanisms can lead to the development of new drugs targeted against these tumor stem cells.

Methods: The five human cell lines (Lung: A549; Breast: BT20, Hs578, MCF7, and T47D) were exposed gradually by increasing quantities of HNO to the NO donor, DETA-NONOate. Parent and HNO cell lines were tagged with red/green fluorescent markers and the isolated mRNA from both were used to compete in a human genome gene chip analysis experiment.

Results: HK1 and COX7C were up-regulated genes whereas LDHB, LDHBP, PDHA1, AC004490.1, and LSM7 were continuously down-regulated.

Conclusion: On exposure to high concentrations of NO, the enzyme in the cellular respiration pathway that was most affected in ADC cell lines was the PDHA1 (Pyruvate Dehydrogenase Alpha 1). This specific enzyme functions by breaking down Pyruvate into Acetyl-CoA, affecting both Glycolysis as well as the Krebs Cycle. The decrease in the number PDHA1 enzymes implies that AC cells have alternate pathways for energy (ATP) formation.

Biography

Juel Chowdhury began his professional education at the Gulf Medical University where he received his Bachelor of Medicine and Bachelor of Surgery degree. Since then, his works have led him to partner and study with Nobel laureate Dr. Ferid Murad and many well-known scientists such as Dr. Robert Winn, Director of UI Health. He is the Founder and President of Oncomarks.org, an online professional network with an open access journal for the oncologists. His innovative iGenX Lab is a genetical research lab based on data-mining and data analysis of the gene-chip experiment. He is an Editorial Board Member for many international journals like Tumor Biology, JCMT, JUMD, and many professional societies like ASCO and ISOBM. He was the Director of ISOBM (International Society of Oncology and Biomarkers)-2016 Congress held in Chicago and also the upcoming ISOBM 2017 Congress in Brazil. He is an expert in Botulinum Toxin and Dermal Fillers, Facial Reconstruction and Hair Transplant procedures. He is a faculty member of National College of Health. His research interests are as follows: Head & Neck Cancer, Lung & Upper Aero Digestive Tumors, Human Tumor Stem Cells, Nitric Oxide in Tumor Environment.

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Khatja Batool et al., Transl Med 2016, 6:4(Suppl)
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Exposure to high levels of Nitric Oxide (NO) showed transmembrane Glycoprotein NMB (GPNMB) over expression in Head & Neck (H&N) Squamous Cell Carcinomas (SCC)

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Hypothesis: Increasing levels of NO can result in the increased expression of genes that contribute to the progression of metastasis of SCC cell lines.

Objective: Cancer metastasis involves an intricate series of events influenced by myriad of regulatory and proliferative factors. Recent research has shown that exposure to high levels of NO induces stem cell like properties in cancer cells resulting in a more aggressive phenotype and worse prognosis. This is mediated through the increase in metastatic potential observed in cancerous cells after exposure to high levels of NO when compared to their parent cell lines. In this study, it was found that cancer cells with high levels of NO exposure tend to over-express the GPNMB gene. This type I transmembrane glycoprotein is up-regulated in various cancers and believed to play a role in metastasis through regulation of cell migration and adhesion using its tripeptide (Arg-Gly-Asp) RGD motif, which is capable of integrin binding. When it comes to the regulation of cell migration, this activity is important in cell adhesion, and other vital processes of metastasis.

Methods: In this study, five H&N cell SCC cell lines were used: SCC016 (tongue), SCC040 (tongue), SCC056 (tongue), SCC114 (floor of mouth), and SCC116 (alveolar ridge). The cell lines were subjected to increased levels of NO by DETA-NONOate until a maximum concentration of 600 mM was reached. In these cell lines, RNAs was isolated from and their respective parent cell lines. Using DNA microarrays, the gene level expression of these NO exposed cell lines were then compared to their individual parent cell lines. This data was further compared to a UniProt-GOA association file (Human) by a program, in order to find genes belonging to certain Gene Ontology (GO) terms. The GO term used was GO:0005178, which contains genes related to the molecular function of integrin binding.

Results: GPNMB was overexpressed in all the five SCC cell lines (SCC016, SCC040, SCC056, SCC114, SCC116). These cell lines which were exposed to high levels of NO appeared to be the most consistently up-regulated. GPNMB contains an RGD motif in its extracellular domain region, which is recognized by many members of the integrin family. Binding of this ligand motif to integrins can lead to important cell adhesion interactions and other metastatic processes.

Conclusion: High levels of Nitric Oxide exposure correlate with an increased metastatic potential through over expression of genes such GPNMB. However, the exact mechanism by which GPNMB contributes to the progression of metastasis is yet to be understood. Additional studies examining GPNMB expression under varying concentrations of NO may aid better understanding of this gene's significance in the cancer process.

Biography

Khatja Batool graduated with her Bachelor of Medicine and Bachelor of Surgery degree from Gulf Medical University, UAE. She started her research at UIC-Chicago, IL where she studied the effects of nitric oxide in cancer stem-cell lines. Additionally, she is a certified expert in Botulinum Toxin, Dermal Fillers and Facial reconstruction. Her distinguished efforts led her to be a part of the Organizing Committee at the 43rd ISOBM Annual Conference in Chicago, IL which was attended by Nobel laureate Dr. Ferid Murad and other well-known scientists. She has her works published in research journals such as Tumor Biology. Furthermore, she is on the Editorial Board for international journals like Tumor Biology and JCMT, Board member at Oncomarks.org and a member of professional societies like ASCO and ISOBM. She has an active interest in oncology research especially in the studies of nitric oxide and telomerase shortening in cancer stem cells.

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Notes:

Saarah T Alkhairy et al., Transl Med 2016, 6:4(Suppl)
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High nitric oxide levels in head and neck Squamous Cell Carcinomas (SCC) has shown down regulation of Cadherin Type-1 (CDH1) gene

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Hypothesis: In head and neck squamous cell carcinomas High Nitric O xide (HNO) levels cause down regulation of genes that has metastatic potential.

Objectives: Nitric oxide is a signaling molecule that in its chemical compound is a powerful vasodilator and a free-radical that all cells in our body produce. At normal levels nitric oxide helps cells to communicate and transmit signals throughout the body. In cancer patients' high levels of nitric oxide are cytotoxic and low levels are considered cytostatic. Cell adhesion, cell signaling and cell communication are regulated by protein coding genes and overexposure to HNO down regulates these genes. High nitric oxide levels were presented in four of the H&N SCC cell lines, in order to study more on the relationship between HNO (high nitric oxide) levels and its metastatic potential. It was observed that HNO in H&N SCC cell lines caused down regulation of CDH1 in all the four cell lines. Abnormalities in tumor suppressor protein coding genes are one of the causes of carcinogenesis. In this case, CDH1 was found to be down regulated. CDH1 gene provides a manual for producing a protein that code for epithelial cadherin or E-cadherin. E-cadherin plays an important role as tumor suppressor gene as it regulates cell adhesion and cell proliferation

Methods: In this study we adjusted the H&N SCC cancer cell lines SCC016, SCC040, SCC056, and SCC114 to HNO. Nitric oxide levels were increased to HNO by DETA-NONOate. DNA microarray was performed in order to compare the control cell line and HNO cell line.

Results: HNO levels in adapted H&N SCC cell lines caused CDH1 genes to be down regulated.

Conclusion: It was studied that adapting HNO to H&N SCC cell lines down regulates CDH1(Cadherin-1) gene which means that the gene expression is either reduced or decreased which increases the metastatic potential. Further research is needed to observe the relationship between carcinogenesis, CDH1 and levels of nitric oxide.

Biography

Saarah Alkhairy has received her Bachelor degree in Business Management from Purdue University, Indiana. Her goal is to combine healthcare and business to affect society on a larger scale. This may include education, pharmaceuticals, and research. She published an abstract in the American Thoracic Society 2016 on PFT in Muscular Dystrophy with Sleep Disordered Breathing in Children and Adolescents. The aim was to determine if the AHI correlates with abnormal PFTs in order to predict the need for a nocturnal polysomnogram. She was an Associate Editor of Wikidoc and a Research Fellow at Perfuse Study Group in Beth Israel Deaconess Medical Center, Massachusetts. She added content and edited highly read and searched topics including bronchiectasis, sleep apnea, interstitial lung disease, colorectal cancer, lung cancer, and basal cell carcinoma for the world's largest medical wiki.

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The tumor suppressor p16^{INK4a} expression bypasses 17AAG mediated cellular effects in human neuroblastoma, IMR-32

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The cancer chaperone, Hsp90 has been identified as a molecular target for cancer treatment interfering majorly with the proliferative potential of cells. Tumor cells can bypass the effects of tumor suppressors either through altered functions or deletions. We show that tumor cells that get adapted to tumor suppressor, p16INK4a circumvent growth suppressing functions and bypass Hsp90 inhibition mediated cell killing. The inability of cells to respond to Hsp90 inhibitor, 17AAG was found to be due to enhanced CDK6 dependent cell cycle regulation. Knocking down p16^{INK4a} enhanced CDK6 dependent cell cycle regulation in NRAS and CRAF dependent manner associating with enhanced migration and invasion. p16^{INK4a}KD cells then showed sensitivity to 17AAG by arresting at G1 phase of cell cycle and inhibiting cell migration and invasion. Further, p16^{INK4a}KD cells showed increased p14ARF, a negative regulator of MDM2 activating DNA damage response (DDR) through p53 stabilization and accumulation of p21$^{WAF1/CIP1}$. Although activated DDR in the functional compromise of Hsp90 induces cytotoxicity, we observed activation of cellular senescence, an alternative strategy to combat cancer. The in vitro findings are being evaluated *in vivo* using mice to affirm the anti-tumor effects of our treatment. Our results thus, have implications in anti-cancer therapeutics specifically against tumor cells that survive despite tumor suppressor expression.

Biography

Abhijnya KVV has major research interest in understanding the role of 'cancer chaperone, Hsp90' in tumor cell adaptations to stress. While several of oncogenic kinases are potential clients of Hsp90, how Hsp90 helps cells to adapt to single kinase mutations is an intriguing question. While addressing this question, I also intended to come out with inducing cellular senescence as a potential anticancer strategy. I have established tumor cells adapted to single mutation in Raf using primary human cells and uncovered how this mutated gene product activates Hsp90. Upon selective targeting of Hsp90 in these cells, they reverted from cancer progression back to senescence. Since the strategy I developed in the course of my study appears to be promising, I aim to bring about more such strategies either using a single Hsp90 inhibitor or in a combination against multiple types of cancers.

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Powerful preclinical mouse model to study live mucin and mucous cell differentiation

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Mucous cells are specialized cells that produce gelling mucins responsible for the mucus gel formation. Modification of mucous cell density and gelling mucin production are established hallmarks of many mucosal diseases including solid tumors (breast cancer, tumors from the digestive, respiratory and reproductive tract), otitis, rhinosinusitis, dry eye, cystic fibrosis, pulmonary fibrosis and asthma. A genetically engineered Muc5b-GFP tagged reporter mouse line at the peptide level was obtained by homologous recombination. Embryonic lung explants allowed to show that interleukine (IL) 13 stimulates Muc5b production. Live Muc5b was easily monitored by probe-based confocal laser endomicroscopy (pCLE) in the nasal cavity, trachea, eye conjunctiva and vagina. As proof of concept that the mouse strain was a valuable preclinical model, we first showed that Muc5b production greatly varied during estrous cycle. We next demonstrated that the decrease in conjunctival goblet cell density monitored by pCLE in living mice with chemically-induced dry eye was reversed by topical application of IL13. The transgenic mouse is unique and suitable for preclinical drug development and suited for pharmacological studies to study the effect of compounds on mucosal homeostasis in living animals.

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Adipose-derived stem cells induce autophagic activation and inhibit catabolic response to pro-inflammatory cytokines in rat chondrocytes

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Aim: Adipose-derived stem cells (ADSCs) have been demonstrated to have an anti-apoptosis effect on chondrocytes. However, their effect on autophagic activation remains unclear. We sought to explore whether ADSCs can activate autophagy and inhibit IL-1β- and lipopolysacccharide (LPS)- induced catabolism in chondrocytes.

Methods: ADSCs and chondrocytes were collected from SD rats. The biologic characteristics of ADSCs were analyzed by flow cytometric analysis, Oil red O and alizarin red staining. Autophagic level and autophagic flux were revealed by western blotting for LC3-II and SQSTM1/P62, MDC (monodansylcadaverine) staining and mRFP-GFP-LC3 analysis. The mTOR pathway was investigated by western blotting for p-mTOR. The mRNA level of matrix metalloproteinases (MMPs) and thrombospondin motifs (ADAMTSs) was detected by real-time PCR.

Results: The typical surface markers and differentiation potentials of ADSCs were proved. ADSCs enhanced the expression of LC3-II/LC3-I and reduced SQSTM1 levels in IL-1β-induced chondrocytes after 24 and 48 hours co-culturing and in LPS-induced chondrocytes after 48 hours co-culturing respectively. mRFP-GFP-LC3 analysis suggested that autophagosomes and autolysosomes were formed earlier in IL-1β-treated chondrocytes than in LPS-treated chondrocytes. Bafilomycin A1 treatment further increased the LC3-II/LC3-I level in chondrocytes in co-culture with ADSCs. The mTOR pathway was inhibited in the chondrocytes in co-culture with ADSCs. Finally, ADSCs inhibited the increase of MMPs and ADAMTSs in chondrocytes induced by IL-1β and LPS.

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An update on methods for cryopreservation and thawing of hemopoietic stem cells

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This presentation will focus on a number of variables related to stem cells cryopreservation procedures of minimally manipulated products containing allogeneic or autologous hemopoietic progenitor cells (HPC) used for transplantation. The issues includes: regulations and standards, processing, process validation and qualification, volume reduction, cell concentration, volume, freezing, storage, cooling rate, warming events, quarantine, cross contamination during storage and thawing. New approaches of processing were developed such as automatic devices for volume reduction and high cell concentration in the frozen product. DMSO at 10% final concentration is still the most used cryo-protectant for HPC cryopreservation. Although controlled rate freezing is the recommended method for HPC cryopreservation, alternative methods may be used. Last generation vapor storage vessels ensure temperature stability better than older tanks and may reduce risks of cross-contamination. Finally, advantages and disadvantages of thawing procedures carried out at patient's bedside or in the laboratory will be discussed.

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DCIS in *BRCA1* and *BRCA2* mutation carriers: Prevalence, phenotype and expression of oncodrivers C-MET and HER3

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Background: Studies report conflicting evidence regarding the existence of a (ductal carcinoma in situ) DCIS-associated premalignant pathway in BRCA mutation carriers. We aimed to examine the prevalence, phenotype and expression of oncodrivers in pure DCIS (pDCIS) and invasive breast cancer with concurrent DCIS (IBC+DCIS) in mutation carriers.

Methods: A cohort of *BRCA1* and *BRCA2* mutation carriers >18 years old who underwent surgery for breast cancer at an academic hospital (1992-2011) and had pathology available for review were included for study. Invasive breast cancer (IBC) and DCIS were stained for ER, PR, HER1, HER2, and HER3, and C-MET. DCIS prevalence was evaluated. Correlation of IBC and DCIS phenotypes was evaluated in patients with IBC+DCIS. DCIS and IBC expression of tumor markers were examined by BRCA mutation.

Results: We identified 114 breast tumors. Of all *BRCA1*-associated tumors, 21.1% were pDCIS and 63.4% were IBC+DCIS. Of all BRCA2-associated tumors, 23.3% were pDCIS and 60.5% were IBC+DCIS. In *BRCA1* and BRCA2 mutation carriers with IBC+DCIS, there was a significant correlation in ER, PR, and HER3 expression between the DCIS and IBC components. Most *BRCA1*-associated DCIS did not express ER, PR or HER2, while most BRCA2-associated DCIS expressed ER and PR. *BRCA1*- as well as BRCA2-associated DCIS had expression of HER3 and C-MET.

Conclusions: The majority of BRCA-associated tumors had DCIS present. Concordance of DCIS and IBC phenotypes was high, arguing for the existence of a DCIS-associated premalignant pathway. Oncodrivers HER3 and C-MET were expressed in the DCIS of mutation carriers, suggesting an opportunity for prevention strategies.

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Psycho-oncology: A psychosocial support and intervention model

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Nowadays, we face a world with a technologic environment changing and advancing constantly, which, in the oncologic scope, implies more advanced investigations and therapies, observing a constant evolution in the management and symptomatic control of the oncologic illness. This scenario implies a higher frequency of patients who suffer its consequences within a short, medium or long time limit, involving permanent adaptation processes. It was already by the mid of the past century that the psycho-oncology subspecialty arises so as to ameliorate the psychosocial adjustment, the oncologic person has to suffer from its multiple effects. Cancer illness considers an impact that transcends not only physical shock but also an emotional process, considering the person as a whole, with personal, familiar and environmental aspects, allowing us to see this illness from a biopsychosocial view. An affective climate is generated creating a complex questioning and deep changes in the various contexts where the patient is set in. The fact of losing what is most important as health, with all its consequences, the person experiences the oncologic mourning. Is this the way how the patient confronts the disease and his/her environment? The distress experience within the process of this illness can bring out negative effects for the patient's health and quality of life. Moreover, the developing of psychiatric disorders is more frequent in oncologic patients than in patients who do not suffer this illness. The major vulnerability of the oncology patients to develop a psychiatric disease is an important issue the medical staff has to take into account, so they require special care and be aware of this patient's emotional needs. In the present article, an interventional model is presented and supported by the emotional aspects studied in the oncologic patient. Relevant aspects are presented and developed the patient's general evaluation, an emotional support structure and the required interventions to fulfill the aims of it.

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Nutritional status of women of reproductive age in a selected char of Rangpur district

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An observational cross-sectional study was carried out at Rangpur district in Bangladesh to assess nutritional status of reproductive aged women residing in char area with a sample size 200. Face to face interview was carried out with the semi-structured questionnaire. Convenient sampling technique was used to collect data on the basis of inclusion and exclusion criteria and written consent was taken prior to interview. Nutritional status was determined according to BMI cut off value for Asian population. Descriptive as well as inferential statistics were used to present data. Mean±SD age of respondents was 34.27±8.60. More than half (67%) of the respondents were illiterate and housewife (84%). Mean±SD income of respondents was 5700.71±282.89 per month. Underweight, normal and overweight were 67%, 30% and 3% respectively. Most respondents took rice 2-3 times/day. Vegetables and soybean were taken randomly. Lentil was taken daily. Arthritis, headache, skin disease was more common. Statistical significant association was found between nutritional status and age group ($p<0.05$), education ($p<0.05$), occupation ($p<0.05$) and monthly income ($p\leq0.05$). Half of the respondents suffered from underweight and most of them income was very low. Income generating capacity should be increased as well as effective nutrition education programme must be instituted.

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