



13th International Conference on

Laboratory Medicine & Pathology

June 25-26, 2018 | Berlin, Germany

Scientific Tracks & Abstracts Day 1

Laboratory Medicine 2018

Sessions:

Day 1 June 25, 2018

**Laboratory Management | Cytogenetics | Clinical Microbiology | Diagnostic Laboratory
Medicine | Microscopy | Transfusion Pathology and Medicine | Pediatric Laboratory Medicine
Clinical Pathology | Antibiotics in Laboratory Medicine**

Session Chair

Petr Starostik

University of Florida in Gainesville, FL, USA

Session Co-Chair

Ian James

Edith Cowan University, Australia

Session Introduction

Title: Thymoquinone synergizes the anticancer properties of cisplatin against head and neck squamous cell carcinoma and protects normal oral epithelial cells

Omar M Al Aufi, King Abdulaziz University, Saudi Arabia

Title: Application of modular chemoenzymatic conjugation strategies for the semi-rational engineering of biologicals

Christoph Hiemenz, Mannheim, Baden-Württemberg, Germany.

Title: Gallbladder Adenocarcinoma; Potential Target For Anti-Her Therapy

Ghazi Zafar, Chughtai Lab, Pakistan

Title: Welcome to a labolution-The application of data mining and systems biology for personalized medicine

Christoph Hiemenz, Mannheim, Baden-Württemberg, Germany

Title: Correlation between Leptin and Thyroid Function Test in Neonates at the Nelson Mandela Academic Hospital in Mthatha, in the Eastern Cape Province of South Africa

Polycarp Ndibangwi, Walter Sisulu University, South Africa

Title: Association between expressions of a panel of immunohistochemistry (IHC) markers including Ki 67, Cyclin D1, p53, bcl2, C-KIT, and Her2/neu and metastatic disease in oral squamous cell carcinoma (OSCC)

Prabhashankar Mishra, Utopia divine wanowrie pune, India

13th International Conference on

Laboratory Medicine & Pathology

June 25-26, 2018 | Berlin, Germany

Thymoquinone synergizes the anticancer properties of cisplatin against head and neck squamous cell carcinoma and protects normal oral epithelial cells

Omar M Al Aufi¹, Abdulwahab Noorwali², Fatheya Zahran³, Ahmed M Al Abd^{2,4,5}, Safia Al Attas² and Fahd M Almtutairi¹

¹Comprehensive Specialized Ployclinic for Security Forces in Medina, Saudi Arabia.

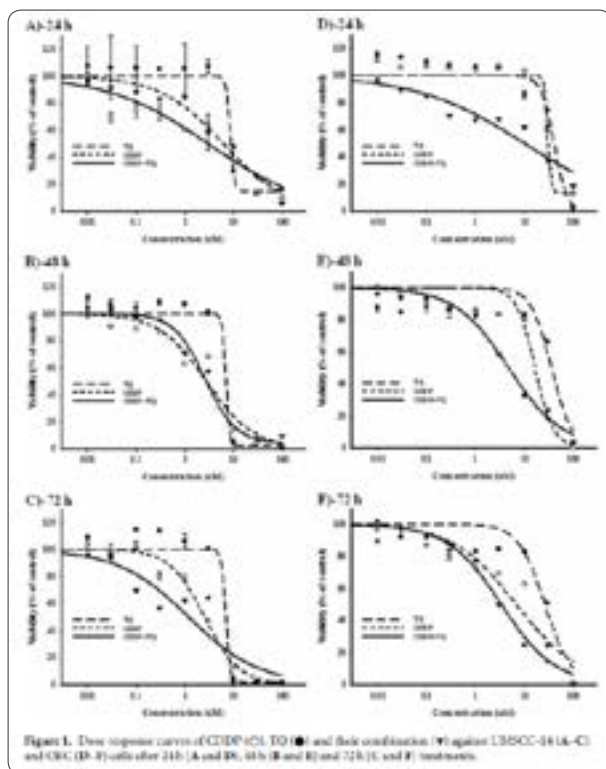
²King Abdulaziz University, Saudi Arabia

³Cairo University, Egypt

⁴National Research Centre, Egypt

⁵Nawah Scientific, Egypt

Cisplatin (CDDP) is a potent anticancer agent used for several tumor types. Thymoquinone (TQ) is naturally occurring compound drawing great attention as anticancer and chemomodulator for chemotherapies. Herein, we studied the potential cytotoxicity of thymoquinone, CDDP and their combination against human oral squamous cell carcinoma cell in contrast to normal oral epithelial cells. CDDP similarly killed both head and neck squamous cell carcinoma cells (UMSCC-14C) and normal oral epithelial cells (OEC). TQ alone exerted considerable cytotoxicity against UMSCC-14C cells; while it induced weaker killing effect against normal oral epithelial cells (OEC). Equitoxic combination of TQ and CDDP showed additive to synergistic interaction against both UMSCC-14C and OEC cells. TQ alone increased apoptotic cell fraction in UMSCC-14C cells, as early as after 6 hours. In addition, prolonged exposure of UMSCC-14C to TQ alone resulted in 96.7±1.6% total apoptosis which was increased after combination with CDDP to 99.3±1.2% in UMSCC-14C cells. On the other hand, TQ induced marginal increase in the apoptosis in OEC and even decreased the apoptosis induced by CDDP alone. Finally, apoptosis induction results were confirmed by the change in the expression levels of p53, Bcl-2 and Caspase-9 proteins in both UMSCC-14c and OEC cells.



CDDP exposure	UMSCC-14		OEC	
	IC ₅₀	S index (%)	IC ₅₀	S index (%)
CDDP	6.2 ± 0.4	100 ± 0.0	10.0 ± 2.4	100 ± 0.0
TQ	5.8 ± 0.8	100 ± 0.0	40.8 ± 2.8	27 ± 0.2
CDDP + TQ	1.4 ± 0.3	100 ± 0.0	10.0 ± 0.7	20 ± 0.4
OEC value (TQ)				
S synergism (%)				
CDDP exposure	UMSCC-14		Normal oral OEC	
	IC ₅₀	S index (%)	IC ₅₀	S index (%)
CDDP	1.2 ± 0.2	100 ± 0.0	10.0 ± 2.0	27 ± 0.2
TQ	1.2 ± 0.2	100 ± 0.0	10.0 ± 2.0	27 ± 0.2
CDDP + TQ	1.2 ± 0.2	100 ± 0.0	10.0 ± 2.0	27 ± 0.2
OEC value (TQ)				
S synergism (%)				

Table 1. Temporal effects of TQ on the cytotoxicity parameters of CDDP in UMSCC-14 and OEC cell lines.

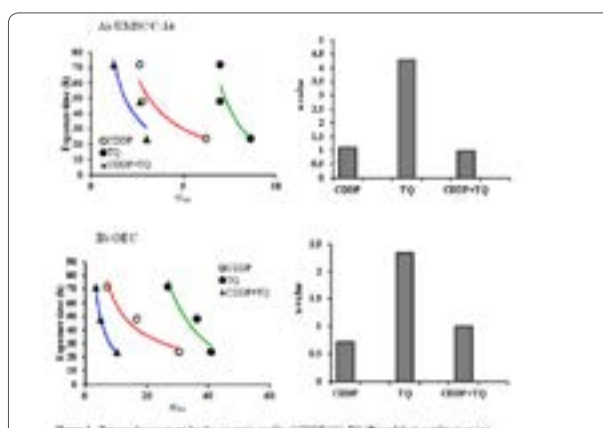
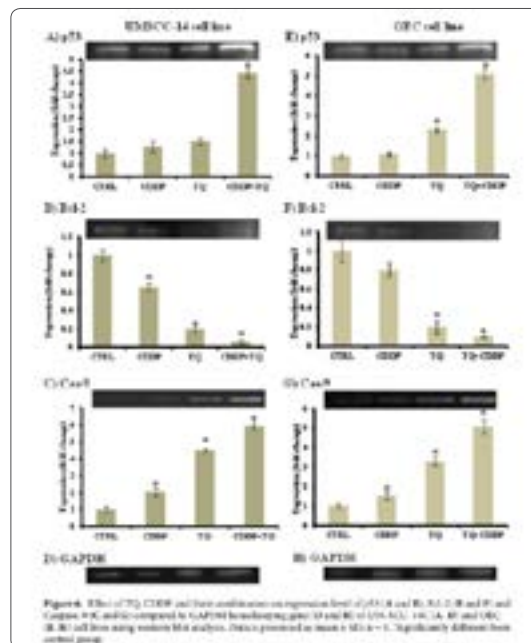
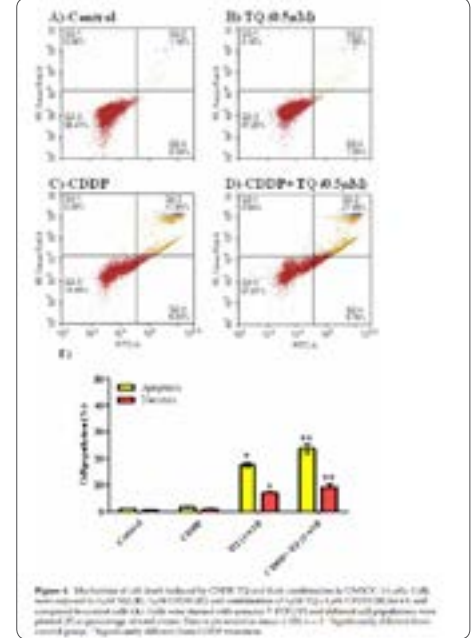
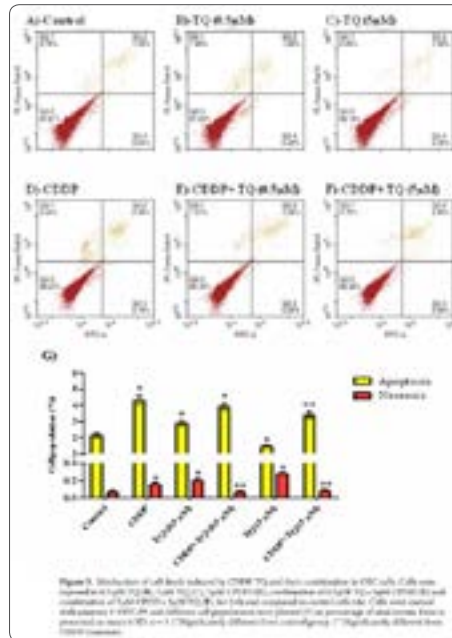
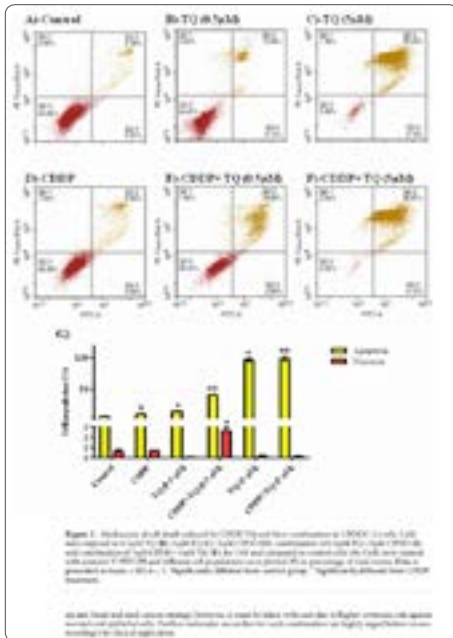


Figure 2. Temporal parameters for the cytotoxic profile of CDDP (●), TQ (■) and their combination (▲) against UMSCC-14 (A and B) and OEC (C and D) cells.



Biography

Omar Al Afi has completed his Master's Degree from College of Medicine, King Abdulaziz University (KAU), Kingdom of Saudi Arabia in Clinical Biochemistry. He is the Head of the Department of Laboratory in Comprehensive Specialized Polyclinic for Security Forces in Medina, Kingdom of Saudi Arabia. He also works at King Fahad Research Center in KAU in Jeddah as a Researcher. He has many oral presentation in his field and has published a paper in *Nature* journal. His research interest include: clinical biochemistry, cancer research and cell culture.

Omaralafi@gmail.com

13th International Conference on

Laboratory Medicine & Pathology

June 25-26, 2018 | Berlin, Germany

Application of modular chemoenzymatic conjugation strategies for the semi-rational engineering of biologicals

Christoph Hiemenz

Ruprecht Karls-University Heidelberg, Europe

Binder drug conjugates such as antibody drug conjugates have led to major improvements of personalized therapy of diseases such as cancer, autoimmunity and pathogenic virulence. The underlying methods which enable the position specific functionalization or semi-rational mutagenesis of bioactive proteins have been the key innovations. While academic research groups are already managing to computationally design small bioactive peptides, the majority of protein engineering projects are still relying on semi-rational directed evolution to identify protein with desirable properties. Here a main leap forward has been the site-directed post-translational mutagenesis of proteins by means of state-of-the art bioconjugation methods including enzymatic sortase A transpeptidation and chemical indium catalyzed mild radical addition of diverse iodoalkanes to sp²-hybridized amino acids. Above all, a multitude of chemoenzymatic functionalization methods are continuously being improved and are fully compatible with directed evolution via cell surface display library screenings



Figure 1: Different ways to functionalize E.coli display proteins while simultaneously releasing them from the cell surface. Blue: transpeptidation of peptides to the cell surface proteins via Staphylococcal sortase A. Orange: Surface release and functionalization of surface displayed proteins by means of expressed protein ligation. Violett: Surface cleavage of surface display proteins by high-specificity proteases. Grey: Surface release of E.coli display proteins by genetically encoded outer membrane proteases

Biography

Christoph Hiemenz has completed his MSc from Ruprecht-Karls University Heidelberg. He work as a bioinformatician at PEPperPRINT GmbH and is the scientific instructor of the iGEM Team Heidelberg 2019. He has worked on diverse research projects: -DKFZ Heidelberg, Prof. Jörg Hoheisel- Kinase activity profiling with peptide arrays -BioQuant Heidelberg, Prof. Roland Eils/Prof. Barbara Di Ventura- Optogenetic nuclear protein shutteling and ODE modeling -KTH Stockholm, Prof. Stefan Stähl – Surface functionalization of E.coli cells via sortases and inteins - EMBL Heidelberg, Dr. Carsten Schultz- Bioactivity of trifunctional Sphingolipids -IPMB Heidelberg, Prof. Andres Jäschke- Multivalent fluorescent turn-on probes for RNA imaging.

Christoph.hiemenz@pepperprint.com

Notes:

13th International Conference on

Laboratory Medicine & Pathology

June 25-26, 2018 | Berlin, Germany

Gallbladder Adenocarcinoma; Potential Target For Anti-Her Therapy

Ghazi Zafar and Zonaira Rathore
Chughtai Lab, Pakistan

Her-2 (ErbB-2) is an oncogene frequently overexpressed in breast and gastric adenocarcinomas and anti Her-2 targeted therapy can be given to such patients. Her-2 overexpression and role of anti Her-2 targeted therapy in cases of gallbladder adenocarcinomas (GBAC) is still debatable. Scoring protocols for Her-2 expression in breast and gastric carcinomas are standardized, however not for carcinomas arising in other body organs like gallbladder. This study is conducted to evaluate expression of Her-2 in patients with GBAC which may benefit from targeted therapy. It is a cross-sectional study conducted on patients with GBAC (n=43; 34 women and 9 men). An automated immunohistochemical technique was used with an anti-ErbB2 antibody. Scoring was conducted according to the CAP (College of American Pathologists) criteria for breast cancer, as well as for gastric and gastroesophageal junction carcinomas. When the scoring protocol for breast carcinomas was used, positive Her-2 staining was observed in 11/43 (25.6%). Out of 11 positive cases, 5 cases (11.6%) were unequivocally positive (3+) and 6 (13.9%) showed equivocal staining. According to the gastric and gastroesophageal junction carcinomas protocol, positive Her-2 staining was observed in 16/43 (37.2%). Out of 16 positive cases, 11 (25.5%) were unequivocally positive (3+) and 5 (11.6%) showed equivocal staining. This study indicates that significant number of GBAC cases show Her-2 overexpression when either of the two documented protocols is used. This subgroup may benefit from inhibitors of the Her-2 pathway. Standardization of scoring protocol for Her-2 expression in GBAC is needed to better evaluate predictive potential of Her-2 for treatment of these tumors.

Biography

Ghazi Zafar completed his MBBS from University of Health Sciences in 2013. He is currently pursuing his Postgraduation Residency in Histopathology from Chughtai Lab, Pakistan.

ghaxy.zafar@gmail.com

Notes:

13th International Conference on

Laboratory Medicine & Pathology

June 25-26, 2018 | Berlin, Germany

Welcome to a labolution-The application of data mining and systems biology for personalized medicine

Christoph Hiemenz

PEPperPRINT GmbH, Germany.

High-throughput technologies ranging from high-content microscopy screening to automated mass spectrometry pipelines and peptide microarray assays enable the generation of big medical data sets in a brief period of time with the requirement of very small analyte volumes. As a result, extremely large multiomics data sets can be generated which are ideally suited for statistical learning procedures using well established classifiers such as random forests or multivariate logistic regression models. To extract meaningful information from the data, a major challenge comprises the dimensionality reduction and unsupervised pattern recognition via machine learning algorithms including Fisher discriminant analysis, shrunken centroid analysis or clustering. Another problem to be tackled is represented by multivariate feature collinearities and ways have to be identified to remove this ambiguity. Yet, the reward for this mathematical rigor is the generation of reliable classifiers which can quickly stratify individual patients into disease/treatment subpopulations with acceptable sensitivity and specificity from multiomics data sets. Above all, technology suppliers such as opentrons and Oxford Nanopore Technologies promise the automated generation of multiomics data sets for a reasonable price.

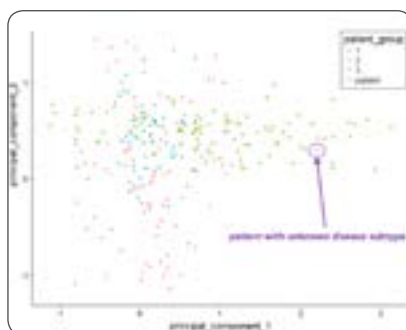


Figure 1: Example data: principal component analysis of simulated peptide microarray data of corresponding to serum responses from different patient collectives. The groups correspond to the microarray serum signals detected for patients with different known pathogenic subtypes of the disease. The principal component dimensionality reduced data is used for the training of classifiers such as random forests or multiple logistic regression models. The PCA data for a patient serum with unknown disease subtype is shown

Biography

Christoph Hiemenz has completed his MSc from Ruprecht-Karls University Heidelberg. He work as a bioinformatician at PEPperPRINT GmbH and is the scientific instructor of the iGEM Team Heidelberg 2019. He has worked on diverse research projects:

- DKFZ Heidelberg, Prof. Jörg Hoheisel- Kinase activity profiling with peptide arrays
- BioQuant Heidelberg, Prof. Roland Eils/Prof. Barbara Di Ventura- Optogenetic nuclear protein shuttling and ODE modeling
- KTH Stockholm, Prof. Stefan Ståhl – Surface functionalization of E.coli cells via sortases and inteins
- EMBL Heidelberg, Dr. Carsten Schultz- Bioactivity of trifunctional Sphingolipids
- IPMB Heidelberg, Prof. Andres Jäschke- Multivalent fluorescent turn-on probes for RNA imaging.

Christoph.hiemenz@pepperprint.com

13th International Conference on

Laboratory Medicine & Pathology

June 25-26, 2018 | Berlin, Germany

Correlation between Leptin and Thyroid Function Test in Neonates at the Nelson Mandela Academic Hospital in Mthatha, in the Eastern Cape Province of South Africa

Polycarp Ndibangwi

Walter Sisulu University, Mthatha, South Africa

This study sought to explore any correlation between leptin and thyroid function test in neonates as available literature shows correlation of leptin with low birth weight, and female gender and congenital hypothyroidism in neonates. Use of leptin to treat hypoleptneamic states in children with congenital leptin deficiency is being developed. It was important to look into this correlation to reveal out the extent to which early leptin administration and testing might be useful in near future for treating diseases such as obesity. The participants' data were collected from their hospital files and the laboratory results. Data were presented, analyzed and discussed according to themes derived from the problem statement. The quantitative data were analyzed statistically whereas the qualitative data reporting took the form of narratives and thick description. It emerged from the study that, majority of the cases' insulin was below reference range. Some of the cases' values of leptin and TSH were higher than for the control. TSH values were all within the reference range but not the same with leptin, insulin and fT4. Strong association between leptin and fT4 observed in the cases than the controls. Leptin showed higher association with birth weight, length and BMI for the control participants. Finally, it emerged that, umbilical cord leptin decreases with age in first three days of life. This study recommends; coordinated efforts to established long term commitment plan to promote healthy nutritional life style at all social levels and more studies on the effects of leptin on metabolic hormones.

Biography

Growing up from a remote community in Africa, I witness a lot of health challenges, and developed early on in my childhood the dream of becoming a medical scientist. Occasionally, I assist at the community clinic where I educate patients on their disease process and the need to adhere to their medications. Currently, my MSc in Chemical Pathology certificate is pending.

ndibangwi@gmail.com

Notes:

13th International Conference on

Laboratory Medicine & Pathology

June 25-26, 2018 | Berlin, Germany

Association between expressions of a panel of immunohistochemistry (IHC) markers including Ki 67, Cyclin D1, p53, bcl2, C-KIT, and Her2/neu and metastatic disease in oral squamous cell carcinoma (OSCC)

Prabhashankar Mishra

Assistant Professor, at utopia divine wanowrie pune, India.

Aim: This study aims to find out any association between expressions of a panel of immunohistochemistry (IHC) markers including Ki 67, Cyclin D1, p53, bcl2, C-KIT, and Her2/neu and metastatic disease in oral squamous cell carcinoma (OSCC).

Materials and methods: A total of 236 cases of OSCC presenting to our centre between Jan 2013-Dec 2016 with available clinical details were included in the study. Forty cases each of non metastatic disease and metastatic disease at presentation were selected randomly for evaluation of IHC marker's expression as enumerated above. IHC expression of the markers were interpreted as positive, negative or indeterminate or non-contributory based on standard practice in clinical use. Other important clinical and pathological features were also noted for further evaluation and analysis.

Results: MIB 1 (Ki 67) index as a percentage value, and diffuse p53 expression were found to be independently associated with metastatic OSCC at presentation (p values <0.001, confidence interval 95%). Cyclin D1, bcl2, C-KIT, and Her2/neu expressions did not show any association with metastatic/ non-metastatic disease at presentation.

Conclusion: MIB 1 mitotic index and p53 positivity are significantly associated with metastatic OSCC. Further studies on this subject are needed to substantiate this important finding which may be used to analyze the role of these IHC markers in possible prediction of metastatic potential and therefore prognosis in the cases of OSCC.

Biography

Prabhashankar mishra, Working as an Assistant Professor, at utopia divine wanowrie pune, India. He was successful achiever producing his work on "Association between expressions of a panel of immunohistochemistry (IHC) markers including Ki 67, Cyclin D1, p53, bcl2, C-KIT, and Her2/neu and metastatic disease in oral squamous cell carcinoma (OSCC)".

psmofi2@gmail.com

Notes:



13th International Conference on

Laboratory Medicine & Pathology

June 25-26, 2018 | Berlin, Germany

Scientific Tracks & Abstracts Day 2

Laboratory Medicine 2018

Sessions:

Day 2 June 26, 2018

**Clinical Applications of Molecular Biology | Diagnostic Laboratory Medicine | Laboratory Toxicology
Molecular Pathology | Hematology | Automation in Laboratory Analysis | Quantitative Techniques
Blotting Techniques | Tissue Engineering | Animal Biotechnology**

Session Chair

Claudio Sorio

University of Verona, Italy

Session Co-Chair

Naglaa kholoussi

The National Research Centre (NRC), Egypt

Session Introduction

Title: Dual chemotherapy and photodynamic therapy: A synergistic strategy to improve cancer treatment

Ana Lazaro-Carrillo, Universidad Autónoma de Madrid, Spain

Workshop: Using Data Analytics To Target Preanalytical Errors And Achieve Higher Value-Added Outcomes

Aparna Ahuja, Medical Affairs, BD Life Sciences - Preanalytical Systems, Franklin Lakes, NJ, USA

Title: In vivo CFTR function by imaged ratiometric measurement of beta adrenergic/cholinergic sweat rate in human sweat glands

Paola Melotti, Centro Fibrosi Cistica-Azienda Ospedaliera Universitaria Integrata Verona piazzale Stefani, Italy

13th International Conference on

Laboratory Medicine & Pathology

June 25-26, 2018 | Berlin, Germany

Dual chemotherapy and photodynamic therapy: A synergistic strategy to improve cancer treatment

Ana Lazaro Carrillo¹, Bruno M Simões², Robert B Clarke² and Angeles Villanueva^{1,3}¹Autonomous University of Madrid, Spain²Manchester Cancer Research Centre - University of Manchester, UK³IMDEA Nanoscience Institute, Spain

Nowadays different strategies are being introduced in order to enhance photodynamic therapy (PDT) effectiveness, such as combination of PDT with chemotherapy or improvement of photosensitizer (PS) features. A new combined PDT-chemotherapy treatment comprising two drugs widespread in clinical research - the hydrophobic zinc(II)-phthalocyanine (ZnPc) as PS and the common chemotherapeutic agent doxorubicin (DOX) - were tested. Cytotoxicity assay showed that this combination remarkably increases the effectiveness of the treatment by inducing a synergistic cell death effect (lower than 10%) when compared to DOX or ZnPc monotherapy (cell surviving around 80%). In addition, annexin-V detection by flow cytometry, analysis of active caspase-3 and cytochrome c by immunofluorescence and time-lapse videomicroscopy corroborated a fine-tunable effect depending on light dose, leading to apoptotic or necrotic mechanism of cell death. Using DCFH-DA (dichlorodihydrofluorescein diacetate) probe, we demonstrate that a significant higher reactive oxygen species generation into cells was the main cause of the synergistic effect of this combined treatment. Further, mammosphere formation efficiency assay showed a reduced breast cancer stem cell activity in established cell line and primary cells obtained from patients, even using DOX at much lower concentration than clinical level. Finally, studies in human breast cancer xenografts indicated a high efficiency also *in vivo*. All these results provide novel and valuable information that contribute to consider chemophototherapy as a promising tool in current antitumoral treatments, potentially overcoming resistance to cancer chemotherapy and targeting cancer stem cells.

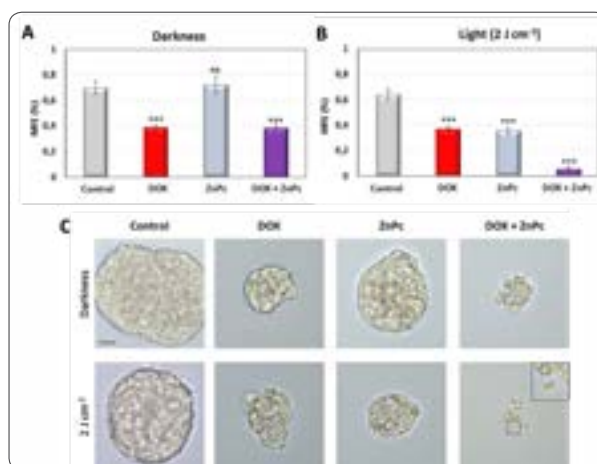


Figure 1: Effect in cancer stem cells (CSCs) in MCF-7 cell line. Evaluation of mammosphere formation efficiency in control cells or after the different treatments under (A) dark condition or (B) irradiated with a light dose of 2 J cm⁻². (C) Morphology of the mammospheres formed after the different treatments in dark and light condition

Biography

Ana Lazaro Carrillo has completed her PhD from Autonomous University of Madrid (Spain) with mention of best thesis in 2017 granted by SEBC (Spanish Society of Cell Biology). She is a Teaching Assistant in the Department of Biology, a premier research organization. She has participated in more than 30 international congresses and more than 70 meetings, workshops and courses. She has published 7 papers in journals of high recognition and has been serving as Reviewer of reputed journals. In addition, she has participated in research and dissemination activities related to Multifun project, funded by the European Union and has been a Research Member of two projects funded by Spanish Ministry for Economy and Competitiveness. Her research interests include: cell biology; photodynamic therapy and chemotherapy for cancer treatment; internalization, biocompatibility and efficient delivery of nanostructures *in vitro* (cell cultures); cell death mechanisms and cellular inactivation; activity of cancer stem cells (established cell lines and patient samples).

ana.lazaro@uam.es

13th International Conference on

Laboratory Medicine & Pathology

June 25-26, 2018 | Berlin, Germany

Using Data Analytics To Target Preanalytical Errors And Achieve Higher Value-Added Outcomes

Aparna Jha Ahuja

BD Life Sciences - Preanalytical Systems, NJ, USA

Data analytics is evolving into a promising method to provide insight from large amounts of data into improving patient outcomes and reducing healthcare costs. Since most of the information used by healthcare providers for medical decisions is derived from laboratory testing, better use of the critical information within the laboratory's data system can help to improve efficiency as well. One application for data analytics is to target the errors encountered in the preanalytical phase. These errors include patient/sample misidentification, hemolyzed/clotted specimens, insufficient specimen quantity, and improper test ordering, all of which may increase costs and negatively impact patient care. Reducing these errors can contribute to higher value-added patient outcomes (e.g., enhanced patient safety, fewer repeat blood draws). Additionally, incorporating data analytics can also assess laboratory competency and identify opportunities for overall quality improvement.

Biography

Aparna Jha Ahuja, MD, is currently the Worldwide Vice President, Medical Affairs, BD Life Sciences - Preanalytical Systems, Franklin Lakes, New Jersey, USA. She has more than two decades of laboratory experience, with hands-on experience in Biochemistry, Specialized Chemistry and Molecular Biology. She is a recognized speaker, having presented at many laboratory medicine conferences. Her current focus is on the improvement of quality laboratory testing and increasing awareness of the impact of the preanalytical phase on clinical diagnostic results.

Julie_Ravo@bd.com

Notes:

13th International Conference on

Laboratory Medicine & Pathology

June 25-26, 2018 | Berlin, Germany

***In vivo* CFTR function by imaged ratiometric measurement of beta adrenergic/cholinergic sweat rate in human sweat glands**

Paola Melotti

Centro Fibrosi Cistica-Azienda Ospedaliera Universitaria Integrata Verona piazzale Stefani, Italy

Sweat secretion rates were given by changes of volume of sweat drops secreted on the forearm in an oil layer, including the presence of a water-soluble blue dye (erioglaucine disodium crystals). We computed a ratio between CFTR-dependent, evoked by intradermal microinjection of a β -adrenergic cocktail (C-sweat), and CFTR-independent, induced by methacoline as cholinergic stimulus (M-sweat), sweat secretion rates by multiple individual glands. The analysis was performed in 22 CF patients, 22 non-CF subjects (CTR), 22 healthy carriers (HTZ) and 3 clinical cases. Sweat secretion rates were given by changes of volume of sweat drops secreted on the forearm in an oil layer, including the presence of a water-soluble blue dye (erioglaucine disodium crystals). We computed a ratio between CFTR-dependent, evoked by intradermal microinjection of a β -adrenergic cocktail (C-sweat), and CFTR-independent, induced by methacoline as cholinergic stimulus (M-sweat), sweat secretion rates by multiple individual glands. The analysis was performed in 22 CF patients, 22 non-CF subjects (CTR), 22 healthy carriers (HTZ) and 3 clinical cases. We obtained an approximately linear readout of CFTR function: the carriers mean ratio was 0.51 the value of non-CF controls while the average ratio of CF subjects was around zero. In a patient affected by CFTR related disorder we found a value in between CF and HTZ mean values. All groups were clearly discriminated with extremely significant differences of C-sweat/M-sweat ratios ($p < 0.0001$ for three groups comparison). This method discriminates between CF and non-CF patients (non-CF controls and heterozygotes), providing sensibility and specificity of 100%. It discriminates between heterozygotes and non-CF controls, providing sensibility 82% of specificity of 86%. We obtained reproducible discrimination when different operators performed the test. A software was developed for detecting sweat bubbles, paving the way for automatically mapping and measuring sweat bubbles as required for automated image analysis. This bioassay is capable to clearly discriminate among non CF, healthy carriers and CF individuals at variance with Gibson and Cooke gold standard sweat chloride assay, is minimally invasive and thanks to its exquisite sensitivity and specificity appears suitable for multicentre studies focusing on CFTR targeted therapies and to assist in the diagnosis of controversial cases. This approach can simplify the analysis and thus promote a better understanding of the functional relevance of rare CFTR mutations.

Biography

Paola Melotti is currently working Cystic Fibrosis Center of Verona, Italy. Paola Melotti has done progressive work on "*In vivo* CFTR function by imaged ratiometric measurement of beta adrenergic/cholinergic sweat rate in human sweat glands" at University of Verona, Department of Pathology and Diagnostics.

paola.melotti@aovr.veneto.it

Notes: