Poster Presentation

Diabetes 2019
Diabetes Congress 2019




Joint Event on

28th International Conference on

Diabetes and Endocrinology

&

3rd International Conference on

Diabetes and Metabolism

November 29-30, 2019 | Frankfurt, Germany

Video Presentation

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Hybrid approach by using Hybrid-TBP for Tuberculosis drug resistance analysis

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Timely correct and rapid prediction of Mycobacterium tuberculosis (MTB) resistance against available tuberculosis (TB) drugs is crucial for control and management of the TB. Various machine learning methods have been largely applied for timely predicting resistance of MTB given a specific drug and identifying resistance markers. Even though, they are not properly validated in the large group of MTB samples across the globe in terms of resistance prediction and resistance marker identification.

Our proposed Hybrid Machine technique named Hybrid-TBP can be used for the identification of Mycobacterium tuberculosis (MTB) resistance beside numerous existing TB drugs for the management and control of TB. In this hybrid machine learning tool initial data samples of MTB data samples is provided to the Principle Component Analysis (PCA) for feature selection and classification is performed for result generation by using Support Vector Machine (SVM) with polynomial kernel. This Hybrid-TBP can be utilized as a supporting software tools in the field of medical science for MTB resistance. As compared to other existing available software MTB prediction tools, this proposed technique gives better performance.

Speaker Biography

Maji S has completed her PhD from Thapar University, India in the year 2013. She is presently working as the Assistant professor at DIT University, Dehradun, India. She has large number of publications that have been cited over 60 times, and his/her publication H-index is 5 and has been serving as a reviewer of reputed Journals.

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Notes:

Accepted Abstracts

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Obesity biomarkers – Merging artificial intelligence with metabolomics

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Obesity—a condition characterized by body mass gain, excess body fat, and risk for development of a number of comorbidities—has become a worldwide epidemic affecting more than 13% of the world population. One important aspect affecting most obese subjects is the development of a chronic, subclinical and systemic inflammation, one of the contributing factors to the development of obesity comorbidities. With advances in artificial intelligence, researchers in the areas of therapeutic and diagnostic targets are working to improve methodologies for more accurate and sensitive identification of specific or set of biomarkers able to predict risk for obesity-associated disorders, such as type II diabetes. Within this context, we analyzed the plasma of eutrophic and obese individuals by mass spectrometry and performed data treatment using random forest-based machine learning algorithms. Five biomarkers related to inflammation in obesity were characterized: metabolites of arachidonic acid, indicating the occurrence of inflammation; molecules associated with dysfunctions in the nitric oxide (NO) cycle and superoxide production; and a diabetes-related species that may be the subject of future studies on the trigger for diabetes in obesity. Calculated accuracy (90.8%) and sensitivity (93.5%) for the model demonstrate that the method is effective in separating groups as a function of differential metabolite profiles given by mass spectrometry. In other words, this work opens a new path for obesity in metabolomics using advanced artificial intelligence strategies for the election and determination of selective targets for diagnostics, prognostics, and therapeutics.

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A review of the putative causal mechanisms associated with lower macular pigment in diabetes mellitus

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Purpose: Macular Pigment confers potent antioxidant and anti-inflammatory effects at the macula, and may therefore, protect retinal tissue from the oxidative stress and inflammation associated with ocular disease and aging. There is a body of evidence implicating oxidative damage and inflammation as underlying pathological processes in diabetic retinopathy, a major cause of vision impairment and blindness. Macular pigment has therefore become a focus of research in diabetes. This review explores the currently available evidence pertaining to MP levels in diabetes, and illuminates the potential metabolic perturbations implicated in MP depletion in diabetic eye disease.

Methods: The review was carried out in two stages. Firstly we identified all relevant published articles from human and animal studies which reported on the relationship between MP (lutein and/or zeaxanthin and/or meso-zeaxanthin) and diabetes (Type 1 & Type 2), up until the year 2019. The second part of the search involved identifying publications which investigated the relationship between the metabolic perturbations typically associated with diabetes, and Type 2 diabetes in particular (e.g. adiposity/dyslipidaemia) and MP. PubMed, Google Scholar, EMBASE, Mendeley, Medline Plus and Scopus were used to search for literature of relevance to MP and diabetes.

Results: Metabolic co-morbidities commonly associated with Type 2 diabetes such as overweight/obesity, dyslipidaemia, hyperglycaemia and insulin resistance, may have added and independent relationships with MP. Increased adiposity and dyslipidaemia may adversely affect MP by compromising the availability, transport, and assimilation of these dietary carotenoids in the retina. Furthermore, carotenoid intake may be compromised by the dietary deficiencies characteristic of Type 2 diabetes, thereby further compromising redox homeostasis.

Conclusion: Candidate causal mechanisms to explain the lower MP levels reported in diabetes include increased oxidative stress, inflammation, hyperglycaemia, insulin resistance, overweight/obesity and dyslipidaemia; factors, which may negatively affect redox status, and the availability, transport and stabilisation of carotenoids in the retina. Further study in a diabetic population is warranted to fully elucidate these relationships.

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ZnO Nanostructure based Electrochemical Bio-Sensors for intra/extracellular glucose measurement

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The nanostructure of zinc oxide (ZnO) such as nanorods and nanowires has interesting nanosurfaces compare to its bulk properties. Recently ZnO have attracted much interest because of its semiconducting, electrochemical, catalytic properties, being biosafe and biocompatible morphology combined with the easiness of growth. This implies that ZnO has a wide range of applications in optoelectronics, sensors, transducers, energy conversion and medical sciences. This abstract relates specifically to electrochemical glucose biosensors for extra/intracellular environment based on functionalized zinc oxide nanorods for biochemical applications. To adjust the sensor for intracellular measurements, the ZnO nanorods were grown on the tip of a borosilicate glass capillary (0.7µm in diameter) and functionalized with polymeric membrane or enzymes for intracellular selective glucose sensors. The sensor in this study was used to detect and monitor real changes of glucose across human fat cells and frog cells using changes in the electrochemical potential at the interface in the intracellular microenvironment. The fabrication of such type of device aims to explain the methodology of ions/glucose sensing using functionalized ZnO nanorods for intracellular environment. This nanoelectrode device paves the way to enable analytical measurements in single living cells.

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