
Scientific Tracks & Sessions

February 06, 2023

Diabetes Congress 2023

31st International Conference on
DIABETES AND ENDOCRINOLOGY
February 06, 2023 | Webinar

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Are we any close to unraveling the mechanism of interactions among susceptibility genes towards Type 1 Diabetes, Gut microbiota along with environmental factors, specifically early diet patterns –A systematic review

Kulvinder Kochar Kaur, Gautam Allahbadia and Mandeep Singh

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Earlier we had reviewed on the aetiopathogenesis of Type 1 diabetes mellitus (T1D) along with role of gut microbiota (GM), genes, immune therapies besides the role of GM in obesity, type 2 diabetes and probiotics in detail. Whereas the pathogens for autoimmune diseases continue to be mostly not clear, genetic proneness as well as environmental factors have been believed to be the main etiologies of the environmental factors the, microbiome is associated with autoimmune diseases through direct as well as indirect crosstalk with innate as well as adaptive immune cells. This leads to loss of immune tolerance, chronic inflammation as well as immune response against host tissues. The posited parts of microbiome in autoimmunity are Molecular mimicry, epitope spreading, bystander activation, as well as continued infection. Further the longitudinal studies have pointed toward the implication of geographical variations .Here we decided to conduct a systematic review on the role of gut microbiota and its relation with Type 1 diabetes mellitus, interaction with other environmental factors like delivery mode ,mode of baby feeding and its impact on GM like use of breast feeding only at least till 4 months ,Ultimately it has been observed that delaying gluten introduction till 4mths as well as cows milk beyond 12mths of age along with addition of early pre/probiotics in those children possessing high risk susceptibility genes. More work is required to evaluate gut virome and other components like archeome; Microbiota of vagina, skin as well as metabolome to arrive at a conclusion .Moreover use of diets like Mediterranean diet, FUN2 as well as ArH targeting to avoid generation of T1D needs to be exploited.

Key Words: gutmicrobiota (GM), Type 1 diabetes mellitus (T1D), probiotics, vaginal delivery, breast feeding

Recent Publications

1. Kulvinder Kochar Kaur,Allahbadia GN,Singh M. Attempting Getting Insulin Independent Immunotherapies in Type 1 Diabetes Mellitus (T1D) in the Pre Stage 1 (Before/let Autoantibodies)". *Acta Scientific Paediatrics* 2020;3(6): 01-04.
2. Kulvinder Kochar Kaur,Allahbadia GN,Singh M. The association of dietary fatty acids and gut microbiota alterations in the development of neuropsychiatric diseases: A systematic review. *Obes Res Open J.* 2020; 7(1): 19-45.
3. Kulvinder Kochar Kaur,Allahbadia GN,Singh M.. Have Probiotics and Synbiotics passed the test of time to be implemented in management of obesity and related metabolic disorders-a comprehensive review. *Adv Obes Weight Manag Control.* 2019;9(1):21–28.

Biography

Kulvinder Kochar Kaur is the scientific director of Dr. Kulvinder Kaur Centre for human reproduction, Jalandhar, Punjab, India, where she manages the complicated cases of infertility. She graduated from LHMC Delhi in 1980 topping in medicine in all 3 medical colleges thereby getting the Dr. Devi Chand Gold medal from the late PM Smt. Indira Gandhi & also topped in all the MBBS subjects prior to that EG, anatomy, pathology, biochem, etc., making her basics sound & later she managed the endocrine clinic in PGI Chandigarh during her MD days. Following that she reported the 40th world case hydrometrocolpos working in Saudi Arabia & has been working in the field of neuroendocrinology of obesity. GnRH control along with the role of kisspeptins, prokinetics in human reproduction, AIDS & Cancer –during this period she managed to successfully treat the first case of non-gestational choriocarcinoma of the uterine body in a young girl medically thereby preserving her fertility-the first case in world literature of its kind. Further she has over 300 publications mostly international in her name.

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Metal ion dyshomeostasis as a driver of coagulatory complications in Diabetes

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Diabetes is a group of conditions that impact upon the body's ability to control blood glucose concentration. In Type 1 Diabetes (T1DM) is largely due to insulin insufficiency. Type 2 Diabetes (T2DM) is associated with defective insulin signaling. Both T1DM and T2DM have wide-ranging consequences for the body as glucose levels are associated with many physiological processes. Individuals with diabetes have an increased risk of cardiovascular disease and coagulatory defects are observed in individuals with T1DM and T2DM. Our work has revealed that metal ion homeostasis is differentially affected in T1DM and T2DM. For example, HbA1c, a marker for elevated blood glucose, correlates with plasma concentrations of magnesium (negatively) in T1DM and copper (positively) in T2DM. Notably, in *ex vivo* experiments, the reduced plasma Mg²⁺ in T1DM was found to be associated with abnormal fibrinolysis. In addition, we have shown that T2DM is associated with defective plasma Zn²⁺ handling, caused by increased Non-Esterified Fatty Acid (NEFA) binding to Human Serum Albumin (HSA) – an interaction which allosterically regulates the ability of the protein to bind and buffer Zn²⁺. Using isothermal titration calorimetry, we reveal that pathophysiological concentrations of NEFAs reduce Zn²⁺ binding to HSA. Addition of myristate and Zn²⁺ increase thrombin-induced platelet aggregation in platelet-rich plasma and increase fibrin clot density and clot time in a purified protein system. The concentrations of key saturated and monounsaturated NEFAs positively correlate with fibrin clot density in individuals with T2DM and controls. Collectively, this work increases our understanding of the roles Mg²⁺ and Zn²⁺ play in the development of thrombotic complications T1DM and T2DM and will have future

implications for the management of diabetes.

Recent Publications

1. Hierons, S.J., Abbas, K., Sobczak, A.I.S. et al. Changes in plasma free fatty acids in obese patients before and after bariatric surgery highlight alterations in lipid metabolism. *Sci Rep* 12, 15337 (2022).
2. Regan-Smith S, Fritzen R, Hierons SJ, Ajjan RA, Blindauer CA, Stewart AJ. Strategies for Therapeutic Amelioration of Aberrant Plasma Zn²⁺ Handling in Thrombotic Disease: Targeting Fatty Acid/Serum Albumin-Mediated Effects. *International Journal of Molecular Sciences*. 2022; 23(18):10302.
3. Czub, M. P., Stewart, A. J., Shabalin, I. G. & Minor, W. (2022). Organism specific differences in binding of ketoprofen to serum albumin. *IUCr* 9, 551-561.

Biography

Alan Stewart graduated from the university of Edinburgh with a BSc (Hons) degree in Biochemistry in 1999 and a PhD in 2003. In 2009 After postdoctoral positions in Edinburgh at the Roslin institute and MRC human reproductive sciences unit he moved to the university of St Andrews to establish his own research group. His research focusses on metal ions in disease. To date his work has attracted grant funding from UK research councils, British heart foundation, fight for sight and the Leverhulme trust. He has published over 85 research papers, many of which are in world class and field-leading journals. He has sat on several UK Research and innovation grant panels, is a member of the Narodowe Centrum Nauki (NCN) - National Science center of Poland funding panel and sits on the editorial boards of the journals, scientific reports, nutrients and BioMetals. He has an H-index of 35 (Google Scholar).

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Diagnosis of thyroid follicular neoplasia: Opportunities and challenges

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Introduction: According to data from fine needle aspiration biopsy (FNAB), prevalence of follicular neoplasia constitutes 10-15% among all thyroid nodules. In the vast majority of cases, we refer to benign neoplasms. In about 1 out of 10-15 cases, follicular neoplasia turns out to be malignant (well-differentiated follicular cancer).

Currently, the main method of preoperative differential diagnosis of thyroid nodules is a cytological examination of the material obtained by fine-needle aspiration biopsy. The accuracy of the cytological diagnosis is 80-92%, whereas the frequency of "indeterminate" cytological response can reach 20%.

In order to stratify the results of FNAB, cytological conclusions are ranked according to the international system The Bethesda System 2017 (TBS) for Reporting Thyroid Cytopathology (TBSRTC). According to this classification, three types of "indeterminate" diagnoses are distinguished: atypia of indeterminate significance/follicular changes of indeterminate significance - category III; follicular neoplasia/suspected follicular neoplasia – category IV; suspected cancer - category V.

According to modern protocols for the treatment of thyroid tumors, in case of an indeterminate response, diagnostic surgical intervention - hemithyroidectomy can be recommended and in the case of category V - thyroidectomy with paratracheal lymph node dissection. Malignancy of the nodule in the final morphological analysis is confirmed in 10–40% of cases after diagnostic hemithyroidectomy in patients with TBSRTC III and IV, while the number of specific complications such as laryngeal paresis or parathyroid insufficiency occurs in 3–10% of cases.

Materials and methods: We analyzed 54 patients (47 women and 7 men) examined at the Moscow Scientific Center named after A.S. Loginov about thyroid neoplasms in the period from March to July 2022. Among this cohort, 17 people (women) were operated on. The volume of surgical

intervention was as followed: 12 hemithyroidectomies, 4 thyroidectomies and 1 thyroidectomy with central cervical lymph node dissection. All patients underwent laboratory and instrumental examinations at the preoperative stage. Cytological conclusion was drawn up based on the results from ultrasound of the thyroid gland, fine-needle aspiration biopsy and assessment of TSH, FT3, T4 antibodies to thyroid peroxidase (Ab-TPO).

Results: According to the obtained results, 1 sample was classified as non-informative (I category Bethesda (TBS)), 27 samples - colloid goiter (II category TBS), 17 samples were classified as follicular neoplasia (IV category TBS), 5 and 2 samples as suspicion for malignancy (V category TBS) and malignant tumor (VI category TBS), respectively. According to the morphological analysis, among patients diagnosed with follicular neoplasia (17 individuals), 6 patients (35%) were diagnosed with malignant thyroid tumor, of which 4 patients were found to have a follicular variant of papillary thyroid cancer, 1 case of follicular thyroid cancer and 1 case of Hurthle cell thyroid carcinoma of the right lobe. 11 patients (65%), were diagnosed with benign neoplasms, of which 7 cases were follicular adenomas of the thyroid and 4 cases were nodular colloid goiter. Therefore, among operated patients diagnosed with follicular neoplasia, malignancy of the neoplasm was confirmed in 35% of cases, whereas 65% of patients were diagnosed with benign neoplasms.

Conclusions: Accurate preoperative differential diagnosis of thyroid follicular neoplasms is of real clinical interest and determines a precision approach to the choice of surgical tactics.

Conflict of interest: The authors declare no conflict of interest.

Recent Publications

1. N. Bodunova et al. A Unique Observation of a Patient with Vultovan Silfhout-de Vries Syndromq, *Diagnostics* 2022, 12, 1887.

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Biography

Natalia Bodunova is a gastroenterologist and the head of the center for personalized medicine. In 2011 she graduated from the Moscow medical academy named after I.M. Sechenov with a degree in Medical Science. From 2011 to 2013, she completed residency training at the Central Research Institute of Gastroenterology. In 2013, she trained at the University Hospital of Geneva, Switzerland. In 2014, she took advanced training courses under the guidance of one of the leaders of metabolic surgery in the USA, Kelvin Higa and then - in California (USA) from the president of the American society of metabolic surgery ninh nguyen. In 2014, she completed an internship in liver diseases at Hadassah hospital, Israel and she defended her Ph.D. thesis on "Vitamin malabsorption after bariatric surgery" in 2015. From 2014 to 2016, she completed her residency in "Endocrinology" at Moscow State Medical University after A.I. Evdokimov. In 2017 she underwent advanced

training in the specialty "Pharmacogenetics and personalized medicine" at the Russia Russian medical academy of postgraduate education n medical academy of postgraduate education. Since 2011, she has been working at the central research institute of gastroenterology (GBUZ MCSC named after A.S. Loginov MHD). The area of professional competence is diseases of the intestine, stomach and biliary system, observation of patients after bariatric operations, development of methods for the prevention of nutritional disorders, correction of vitamin and trace element deficiencies and treatment of malabsorption syndrome after various surgical interventions. She is an author of more than 90 scientific publications in Russian and foreign publications.

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Glucose transporter type 4 mediates the cardioprotective effects of RAS antagonism in the Diabetic Heart

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Background and objectives: Diabetes mellitus (DM) is a risk factor for cardiovascular diseases specifically the ischemic heart diseases (IHD). Renin angiotensin system (RAS) affects the heart directly and indirectly. However, its role in the protection of the heart against ischemia and reperfusion (I/R) injury is not completely understood. The aim of the current study was to evaluate the efficacy of the angiotensin-converting enzyme (ACE) inhibitor and Angiotensin II receptor (AT1R) blocker or a combination thereof in protection of the heart against I/R injury.

Methods: Hearts isolated from adult male Wistar rats (n=8) with STZ-induced diabetes were used in this study. Hearts were subjected to I/R injury, treated with Captopril, ACE inhibitor, Losartan, AT1R antagonist or a combination thereof. Hemodynamic data was acquired online using software designed specifically for that purpose. Infarct size was evaluated using 2,3,5-Triphenyltetrazolium chloride (TTC) staining. Hearts lysates were used to evaluate the levels of apoptosis markers (caspase 3 and 8) and Glucose transporter type 1 and 4 (GLUT-1 and GLUT-4) using Western blotting. Pro-inflammatory cytokines were evaluated by enzyme linked immunosorbent assay (ELISA). Data were analyzed using two-way analysis of variance (ANOVA).

Results: Captopril and Losartan alone or in combination abolished the effect of I/R injury in the diabetic hearts. Captopril and Losartan alone or in combination resulted in a significant (P<0.05) recovery in the hemodynamics, reduced the infarct size and the apoptosis markers. Treatment with Captopril, Losartan and their combination significantly (P<0.05) reduced, pro-inflammatory cytokines and increased GLUT-4 protein levels. Conclusions: Blocking RAS system protected the diabetic heart from I/R injury. This protection

followed a pathway that uses GLUT-4 axis to decrease the apoptosis markers and pro-inflammatory cytokines.

Acknowledgement: We acknowledge the health Science Center animal facility for providing the animals. This study was supported by grant #MY01/18 from Research Administration, Kuwait University, Kuwait

Key words: Ischemia Reperfusion, RAS, Captopril, Losartan, Diabetes mellitus, Hyperglycemia.

Recent Publications

1. Mitigating Cardiotoxicity of Dendrimers: Angiotensin-(1-7) via Its Mas Receptor Ameliorates PAMAM-Induced Cardiac Dysfunction in the Isolated Mammalian Heart. DOI: 10.3390/pharmaceutics14122673
2. Gum Arabic protects the rat heart from ischemia/reperfusion injury through anti-inflammatory and antioxidant pathways. DOI: 10.1038/s41598-022-22097-0
3. Early Time Course of Oxidative Stress in Hippocampal Synaptosomes and Cognitive Loss Following Impaired Insulin Signaling in Rats: Development of Sporadic Alzheimer's Disease. DOI: 10.1016/j.brainres.2022.148134

Biography

Dr. F. A. Babiker is a Professor at the department of physiology, faculty of medicine, Kuwait University, Kuwait. He is a molecular cardiologist with training and research experience at department of cardiology, faculty of medicine, Maastricht University, the Netherlands. Previously, he served as a research associate at the department of physiology, Cardiovascular Research Institute Maastricht (CARIM) and a lecturer at the premedical school, Maastricht University, Maastricht, the Netherlands. He worked on many projects on ischemia/reperfusion injury and heart failure.

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Forensic Law in Hypoglycaemia - 3

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Purkinje cells are specialized brain cells. There are no Purkinje cells in our legs and feet. Sensory nerves are at higher risk of damage in people with Diabetes leading to diabetic neuropathy. Patients lose sensation in their lower extremities making them vulnerable to injury and they don't feel the pain. That can lead to severe damage and because of high blood glucose, wounds get difficult to heal. Gas and gangrene develop and this leads to the only resort being amputation and life change challenges.

Diet, lifestyle, mental health and clinical treatment of Diabetes and Thyroid Disease, including Addison's Disease, plays an important role in patient welfare. Tragically many patients die young or go through life suffering from the old Victorian Stigma of being tainted by having to treat an incurable illness. This is not a joke as suggested in September 2006 in ignorance by a Hertfordshire Insurance Broker describing Diabetes with Neuroglycopenia as a Joke and Nonsense causing Obstructed Justice in Law of a critical life-threatening complication of Diabetes and Endocrinology Disease. A patient requiring a clinician to prescribe Insulin justifies clinical respect and understanding in English Law which has been misunderstood since 1994 with sad

consequences in the investigation.

Today in recovering and managing the Covid-19 Pandemic of 2020 we move forward with new welfare ideas. It is a delight to be able to share some latest work with you for future research based on 44 years of T1D experience.

Recent Publications

1. Diabetes and Covid-19 Pandemic - A T1 Patient Perspective – Derek C Beatty ISSN 2639-8109
2. Forensic Aspects of Hypoglycaemia doi: 10.35248/2155-6156.20.11.e103

Biography

Derek Beatty gained his BSc in biological science & business studies, from Edinburgh University, in 1972 and his diploma in marketing, from slough college, in 1977. He is a Director of Aston Clinton scientific Ltd since 1997 supplying respiratory nebulizers and specializing in diabetes. He is a healthcare consultant. He recently founded Mobile Med Tech Ltd to offer a mobile Diabetes service in Scotland involving NHS Scotland with experience in the team launching Europe's first mobile MRI Service in 1990. He has had T1D for 42 years and overcome diabetic retinopathy.

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Molecular aspects of thyroid cancer

Tsapkova L A, Feydorov I Y, Nikolaev S E, Osipova (Savinkova) A V, Khatkov I E, Thazeplova L A and Bodunova N A
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Thyroid cancer constitutes a significant part of the malignant neoplasms of the endocrine system. Most tumors of this organ are of follicular cell origin and only 5-10% are parafollicular - C-cell (medullary) cancers. Currently, there are difficulties in the preoperative diagnosis of thyroid neoplasms. None of the currently employed methods have 100% specificity and sensitivity for the diagnosis of thyroid cancer. On the basis of a cytological study, it is not possible to distinguish, for example, follicular adenoma from follicular cancer, which is a significant problem when it comes to choosing the tactics of surgical treatment.

Thus, it is important to search for additional tools for preoperative differential diagnosis of thyroid neoplasms. A promising direction in this regard is the evaluation of the molecular genetics and expression profile of a thyroid tumor, the search for biomarkers that, in combination with a cytological study, would increase the accuracy of preoperative diagnosis of thyroid neoplasms.

The key and most studied events leading to the activation of mitogen-activated protein kinase (MAPK) signaling pathways that transduce myogenic signals and regulate cellular processes such as proliferation, differentiation and viability are mutations in the receptor (RET) and intracellular signaling molecules (BRAF and RAS). Mutations in the abovementioned genes are the most common tumor-initiating event in differentiated forms of thyroid cancer and are associated with specific clinical, histopathological and biological characteristics of tumors.

The most common somatic mutation in malignant neoplasms of the thyroid gland is V600E in the BRAF gene. The frequency of mutations in the BRAF gene in papillary thyroid

cancer is 40–45%, 1.3% in follicular thyroid cancers, 20-40% in poorly differentiated thyroid cancers and in anaplastic thyroid cancers the frequency is 30–40%. The frequency of mutations in codon 61 (Q61R, Q61K) in the NRAS gene in thyroid cancers is 6%, in codons 12, 13 and 61 in the KRAS gene - 3%.

Significant amount of evidence has been obtained by studying the expression profile of genes in thyroid tumors. An analysis of the literature data showed that the SDC4, PLCD3, PVRL4 genes are the most discriminating for the differentiation between benign and malignant neoplasms with a sensitivity and specificity of 100%, the SLC4A4 gene was the most effective marker in distinguishing between classic follicular cancer and the follicular variant of papillary cancer and papillary cancer.

Currently, on the basis of Moscow Clinical Scientific Center named after A. S. Loginov MHD, a number of somatic mutations and the expression profiles of thyroid neoplasms are being evaluated.

Recent Publications

1. Bodunova N.A., Tsapkova L.A., Osipova (Savinkova) A.V. Possibilities of molecular genetic measurements in the differential diagnosis of thyroid neoplasms. // X Anniversary International Scientific and Practical Conference "Molecular Diagnostics 2021". - Moscow, p.154.

Biography

Larisa Tsapkova is a researcher at the laboratory of oncogenetics and common diseases, a candidate for biological sciences SBHI Moscow clinical scientific center named after a. S. Loginov MHD. Research interests: oncogenetics, laboratory genetics, genetic identification.

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The study of Metformin Glycinate as a new treatment option in Mexican populations; *In vitro* and *In vivo* experience

Jorge González-Canudas, Yulia Romero-Antonio, Marcela Arguedas-Núñez, José G. Sander-Padilla, Alberto Martínez-Muñoz, Laura A. Lugo-Sánchez, Ileana C. Rodríguez-Vázquez, Alexei F. Licea-Navarro and Lourdes Garza-Ocañas

Laboratorios Silanes S.A. de C.V, Mexico

Metformin Glycinate (MG), it's a new molecule derived from Metformin, which has recently been studied and compared with reference therapy and shown to have a similar antihyperglycemic effect and a better bioavailability, absorption and safety profile. (1-3) Laboratorios Silanes has developed a new salt: MG, which has been tested in experimental animals and studies carried out in healthy volunteers and in patients with type 2 diabetes, including patients infected with SARS-CoV2. We present the findings of these studies. The results from the *in vitro* study demonstrated the effective inhibition of viral replication 48 hours after starting treatment with MG, without reports of any cytotoxic effect even with high doses. These results were confirmed by our clinical study, where patients with diabetes infected by SARS-CoV2, showed a lower oxygen requirement compared to control patients, due to a significant reduction in viral load just after 3.3 days of treatment. In order to demonstrate the oral bioavailability of MG compared to MH, a clinical study was carried out in healthy subjects under fasting conditions, observing a different pharmacokinetic profile for MG vs MH with a greater rate and degree of absorption for MG. A phase II clinical study was carried out, with the objective of determining the pharmacokinetic profile in an elderly population with T2DM (Type 2 Diabetes Mellitus), in order to know its effect in special populations. In this study, an adequate pharmacokinetic profile and safety of MG in elderly patients was confirmed, as there were no adverse events related to MG. This line of research continues, with the purpose of positioning MG as an innovative treatment which efficacy and safety have been

proven through several studies.

Recent Publications

1. National Library of Medicine (U.S.). 2018. Metformin Glycinate on Metabolic Control and Inflammatory Mediators in Type 2 Diabetes (COMET). Identifier NCT01386671.
2. J. González-Canudas, Comet Group, 146-LB: Efficacy and Safety of Metformin Glycinate vs. Metformin Hydrochloride in Metabolic Control and Inflammatory Mediators in Type 2 Diabetes Mellitus Patients (T2DM), ADA (2019) 68.
3. Ventura-López C, Cervantes-Luevano K, Aguirre-Sánchez JS, Flores-Caballero JC, Alvarez-Delgado C, Bernaldez-Sarabia J, Sánchez-Campos N, Lugo-Sánchez LA, Rodríguez-Vázquez IC, Sander-Padilla JG, Romero-Antonio Y, Arguedas-Núñez MM, González-Canudas J, Licea-Navarro AF. Treatment with metformin glycinate reduces SARS-CoV-2 viral load: An *in vitro* model and randomized, double-blind, Phase IIb clinical trial. Biomed Pharmacother. 2022 Aug;152:113223.

Biography

Jorge Alejandro González Canudas is currently working as medical and clinical research director at Laboratorios Silanes, S.A. De C.V. in Mexico. He participated in research projects through public and/or private calls on the Development of a new molecule for the treatment of type 2 diabetes, Development of new combinations of drugs and supplements for a more effective and safe treatment for metabolic syndrome. He is the author of over 30 articles related to infectious diseases, microbiology, diabetes and cardiovascular and metabolic diseases. As well as author in various books, consensus and book chapters related to these topics.

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Carpachromene ameliorates insulin resistance in HepG2 cells via modulating IR/IRS1/PI3k/Akt/GSK3/FoxO1 pathway

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Insulin resistance contributes to several disorders including type 2 diabetes and cardiovascular diseases. Carpachromene is a natural active compound that inhibits α -glucosidase enzyme. The aim of the present study is to investigate the potential activity of carpachromene on glucose consumption, metabolism and insulin signaling in a HepG2 cells insulin resistant model. A HepG2 insulin resistant cell model (HepG2/IRM) was established. Cell viability assay of HepG2/IRM cells was performed after carpachromene/metformin treatment. Glucose concentration and glycogen content were determined. Western blot analysis of insulin receptor, IRS1, IRS2, PI3k, Akt, GSK3, FoxO1 proteins after carpachromene treatment was performed. Phosphoenolpyruvate Carboxykinase (PEPCK) and Hexokinase (HK) enzymes activity was also estimated. Viability of HepG2/IRM cells was over 90% after carpachromene treatment at concentrations 6.3, 10 and 20 μ g/mL. Treatment of HepG2/IRM cells with carpachromene decreased glucose concentration in a concentration- and time dependent manner. In addition, carpachromene increased glycogen content of HepG2/IRM cells. Moreover, carpachromene treatment of HepG2/IRM cells significantly increased the expression of phosphorylated/total ratios of IR, IRS1, PI3K, Akt, GSK3 and FoxO1 proteins. Furthermore, PEPCK enzyme activity was significantly decreased and HK enzyme activity was significantly increased after carpachromene treatment. The present study examined, for the first time, the potential antidiabetic activity of carpachromene on a biochemical and molecular basis. It increased the expression ratio of insulin

receptor and IRS1 which further phosphorylated/activated PI3K/Akt pathway and phosphorylated/inhibited GSK3 and FoxO1 proteins. Our findings revealed that carpachromene showed central molecular regulation of glucose metabolism and insulin signaling via IR/IRS1/PI3K/Akt/GSK3/FoxO1 pathway.

Recent Publications

1. Ahmed Ashour, Ahmed Elbermawi, Yhiya Amen, Ahmed E. Allam, Hiromi Ikeda, Maki Nagata, Kenta Kumagai, Tomoyo Azuma, Aya Taguchi, Takuya Takemoto, Masako Matsumoto and Kuniyoshi Shimizu. Melanin Synthesis Inhibition Activity of Compounds Isolated from Bamboo Shoot Skin (*Phyllostachys pubescens*). *Molecules* 2023, 28, 23.
2. Rania Alaaeldin, Heba Ali Hassan, Islam M. Abdel-Rahman, Reham H. Mohyeldin, Nancy Youssef, Ahmed E. Allam, Sayed F. Abdelwaha, Qing-Li Zhao and Moustafa Fathy. A New EGFR Inhibitor from *Ficus benghalensis* Exerted Potential AntiInflammatory Activity via Akt/PI3K Pathway Inhibition. *Curr. Issues Mol. Biol.* 2022, 44(7), 2967-2981;
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Biography

Ahmed Ezzaldeen Abdellah Allam completed his Ph.D. in pharmacognosy and chemistry of natural products at the graduate school of natural science and technology, Kanazawa University, Kakuma-machi, Kanazawa, Japan. Then he completed his postdoctoral fellowship in the

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Common genetic markers of type 1 Diabetes mellitus and autoimmune diseases

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There is an increase in the number of patients with autoimmune diseases (AID). Attention to the combination of several autoimmune pathologies in one patient. Such patients requires the definition of an observation algorithm. Patients with type 1 diabetes mellitus and their relatives have associated AID with a higher incidence compared to the general population. In addition, the role of genetic predisposition is obvious. Genetic markers help to capture the pathogenesis of a disease. As a result, screening, wound infection, prevention and treatment are developing.

Recent Publications

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Biography

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Chronic constipation in patients with type-2 Diabetes: Prevalence and associated factors

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Introduction: One of the most prevalent and chronic metabolic illnesses is diabetes mellitus. It is one of the most challenging and difficult global health issue. Constipation is frequently seen among the lower gastrointestinal symptoms in diabetes patients, who almost all experience at least one gastrointestinal symptom. Despite the fact that constipation is common, doctors and/or patients disregard it. Determining the prevalence and contributing factors of constipation in patients with diabetes mellitus was the goal of the current investigation.

Methods: A cross-sectional study was carried out in a hospital setting and systematic sampling was used. The data was entered in Epi-Data 4 and exported to STATA 14 for analysis. Binary and logistic regressions were also carried out to identify variables associated to constipation. Factors having a p-value of less than 0.05 were deemed statistically significant in the final model.

Results: 206 diabetics participated in the survey. The mean age of the participants was 52.7 years (SD±11.9) and 92(44.7%) of individuals with diabetes were females. The prevalence of constipation was 16% (95% CI: 10.97-21.07). Age (AOR=13.56; 95% CI: 1.71, 107.21), females (AOR=4.58; 95% CI: 1.76, 11.87), the duration of the diabetes (AOR=3.16; 95% CI: 1.21, 8.24) and psychological distress (AOR=12.49, 95% CI: 1.53, 101.8) were significant factors.

Conclusion: The magnitude of constipation was substantial and it was linked to psychological distress, longer-lasting diabetes, being a woman and aging. Patients with type-2 diabetes need to receive careful treatment in order to reduce the severity of the condition and its further complications.

Recent Publications

1. Cognitive impairment and associated factors among mature and older adults living in the community of Gondar town, Ethiopia, 2020 DOI: 10.1038/s41598-022-11735-2
2. Visual impairment and its predictors among people living with type 2 diabetes mellitus at Dessie town hospitals, Northeast Ethiopia: institution-based cross-sectional study DOI: 10.1186/s12886-022-02292-3
3. Predictors of dream enactment behavior among medical students: The case of the University of Gondar, Ethiopia. DOI: 10.1371/journal.pone.0263884

Biography

Mohammed Abdu Seid, MSc in medical physiology, lecturer and researcher at Debre Tabor University, college of medicine and health science, Ethiopia. He has also participated in community service and research alongside lecturing. He is a young researcher having more than 20 publications that have been cited close to 100 times and published in international peer-reviewed journals. He has been serving as a reviewer member of more than 10 reputed international journals.

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Genesis and potentials of (PEG)-BHD1028 – A potent agonist to adiponectin receptors, AdipoR1 and AdipoR2

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Adiponectin, an adipokine predominantly produced by white adipocytes, has been known to play various critical roles and offer physio-regulatory benefits, including improvement in insulin sensitivity, enhancement of energy metabolism and anti-inflammation. It has also been known that many diseases are negatively associated with plasma adiponectin concentration. (PEG)-BHD1028 was designed as an agonist of adiponectin receptors, AdipoR1 and AdipoR2, based on the amino acid sequence of the active binding sites using a binding docking simulation. (PEG)-BHD1028 is a novel 15-aa peptide and its design reflects dual binding sites on each receptor as verified by SPR analysis. Besides the physicochemical characterization of the molecule, a series of biological evaluations were performed to verify its functions *in vitro* and *in vivo* systems. The results indicated that the molecule exhibited adiponectin-like biological behaviors via the activation or inactivation of pathophysiological signals such as APPL1, PPAR α , AMPK, ACC, Akt and Erk pathways. Furthermore, the peptide effectively lowered glucose through the amelioration of insulin resistance and led to weight loss without compromising appetite in the disease model animal study. These findings suggest that (PEG)-BHD1028 may offer therapeutic opportunities for

the diseases associated with suboptimal adiponectin levels, such as type 2 diabetes mellitus, NASH, obesity and dry eye disease.

Recent Publications

1. Kim S, Lee Y, Kim JW, Son Y-J, Ma MJ, Um J-H, et al. (2018) Discovery of a novel potent peptide agonist to adiponectin receptor 1. PLoS ONE 13(6): e0199256.
2. Lee IK, Kim G, Kim D-H, Kim BB. PEG-BHD1028 Peptide Regulates Insulin Resistance and Fatty Acid β -Oxidation and Mitochondrial Biogenesis by Binding to Two Heterogeneous Binding Sites of Adiponectin Receptors, AdipoR1 and AdipoR2. International Journal of Molecular Sciences. 2021; 22(2):884.

Biography

Brian Kim has over 30 years of experience in the pharmaceutical industry in the US and South Korea as an executive member in the field of R&D, global regulatory/compliance affairs and global supply chain. He also served as an advisor to several departments of the Korean government. He currently serves as the CEO at EncuraGen, Inc. in South Korea. He studied biochemical toxicology during his MS and Ph.D. programs at the University of Northern Colorado in the US. He completed his Ph.D. in bioprocessing engineering at Inha University in South Korea.

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Effect of performing high-intensity interval training and resistance training on the same day vs different days in women with type 2 Diabetes

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Type 2 Diabetes (T2D) is associated with chronic inflammation as a critical factor for muscle atrophy and disease progression. Although the combination of aerobic and resistance training leads to more significant improvements in health-related indices for T2D patients, the interference effect in concurrent training can decrease positive adaptations. The purpose of this study was to investigate the physiological adaptations in performing High-Intensity Interval Training (HIIT) and resistance training on the same day vs. different days in T2D patients. Twenty-four non-athletic 45–65-year-old women with T2D participated in an 8-week intervention. They were randomly divided into three groups: Same Days (SD), Different Days (DD) and treatment as usual (control). SD group had resistance training followed by HIIT on Saturday, Monday and Wednesday. In contrast, the DD group had the same volume of resistance training on Saturday, Monday and Wednesday and HIIT on Sunday, Tuesday and Thursday, with Friday as a resting day. Blood samples were collected 24 h before the first and 48 h after the last session in each group to measure glucose, insulin, glycosylated hemoglobin, IGF1, IL1 β , CRP, lipid profile, miR-146a and miR29b. Three subjects dropped out during the study and 21 participants (SD=7, DD=6, Control=8) completed the 8-week intervention. MiR-146a changed significantly ($P=0.006$) in both SD and DD groups compared to the control group. IGF1 ($P=0.001$) and fat-free mass ($P=0.001$) changed significantly in SD and DD groups compared to the control group and also DD led to more significant increases in IGF1 and fat-free mass in comparison with SD. MiR-29 ($P=0.001$) changed significantly in the DD group compared to the control group. The reduction of IL-1 β , fat mass and insulin resistance was significant in SD and DD compared to the control group; DD showed more potent effects than the SD group on the fat mass ($P=0.001$)

and insulin resistance ($P=0.001$). This study demonstrated that a combination of HIIT and resistance training could be practical for improving health-related outcomes in T2D. Our study indicated for the first time that training strength and HIIT on separate days appeared to be more effective to combat muscle atrophy and insulin resistance.

Keywords: Type 2 diabetes, Inflammation, Muscle atrophy, Concurrent training

Recent Publications

1. Ghodrat, L., Razeghian Jahromi, I., Koushkie Jahromi, M. et al. Effect of performing high-intensity interval training and resistance training on the same day vs. different days in women with type 2 diabetes. *Eur J Appl Physiol* 122, 2037–2047 (2022)
2. Ghodrat, L., Nemati, J., & Koushkie Jahromi, M. (2021). A Comparison of the Effect of Two Different Orders of Combined Training on Inflammatory and Muscle Atrophy Biomarkers in Women with Type 2 Diabetes. *Sport Physiology & Management Investigations*, 12(4), 83-95.
3. The Effect of a Detraining Period after Two Type Concurrent training on the Exercise Performance and HbA1c in Women with Type 2 Diabetes

Biography

Leila ghodrat has his/her Ph.D. in exercise physiology biochemistry and exercise metabolism from Shiraz University, Fars, Iran. She is a teacher at Shiraz University and Zand University in the following subjects: physical education, information systems and technology in sports (it), health and nutrition, physics in sports, sports physiology and training science. She is also an instructor at a public sports federation on sports nutrition, physical fitness and training science.

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Diabetic eye disease and research - A patient's perspective

Bernadette Warren

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Much has occurred within the last few years as far as diabetic eye disease research is concerned. In the UK in 2011 only one intravitreal drug was available for these patients and now there are many more and more to come. Biosimilars will make a large difference too when they are available in the near future. This will surely afford greater opportunity for a larger option of treatments for patients. Encouraging patients to take part in research is vital to the work of researchers and ensuring that a valued experience is gained from both sides is important. Understanding what patients understand about research and how much knowledge they have of the process is a key. A good patient experience starts with the understanding of their needs and expectations.

Biography

Bernadette Warren was diagnosed with Diabetic Macular Odema (DMO) in 2011. Since losing her job as a teacher due to sight loss she gives HCPs and students the opportunity to understand what living with diabetes and visual impairment is like. These organizations have included universities, hospitals, CCGs, charities and many pharma companies. In 2021 Bernadette alongside the Macular Society set up a DMO support group that supports both patients and carers. She uses much technology to help her manage her diabetes and has seen the real advantage that this brings. Bernadette has a keen interest in research, especially those concerning diabetic eye conditions and is an NIHR BRC Insight advisor. She has taken part in NICE technology appraisals for new treatments for DMO and is a lay member of the NICE Diabetic Retinopathy committee as well as an expert patient for the same organization.

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Diabetes management in spinal surgery

Brandon Lucke-Wold

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Diabetes mellitus can lead to long-standing complications in multiple arenas. An area that is often overlooked is implications for major surgery. Spinal decompression and fusions have unique challenges in the diabetic patient. In this review, we briefly highlight the pathophysiology of diabetes mellitus prior to examining implications for spinal surgery. We focus on the wound healing process, surgical infection risk and delayed fusion. The paper then transitions to a focus on early diagnostics as well as pre-operative glucose control. Finally, we highlight important management strategies post operatively, continued necessity of monitoring and emerging treatment and diagnostic approaches. This paper will serve as a key clinical guide that clinicians can utilize for diagnostic, management and follow-up planning.

Recent Publications

1. Goldman M, Lucke-Wold B, Martinez-Sosa M, Katz J, Mehkri Y, Valisno J, Quintin S. Steroid utility, immunotherapy and brain tumor management: an update on conflicting therapies. *Explor Target Antitumor Ther.* 2022;3(5):659-675.
2. Shokoufeh Khanzadeh, Hossein Tahernia, Jairo Hernandez, Camila Sarcone, Brandon Lucke-Wold, Amirhosseinn Salimi, Fatemeh Tabatabaei, "Predictive Role of Neutrophil to Lymphocyte Ratio in Adnexal Torsion: A Systematic Review and Meta-Analysis", *Mediators of Inflammation*, vol. 2022, Article ID 9680591, 8 pages, 2022.

3. Mehkri Y, Woodford S, Pierre K, Dagra A, Hernandez J, Reza Hosseini Siyanaki M, Azab M, Lucke-Wold B. Focused Delivery of Chemotherapy to Augment Surgical Management of Brain Tumors. *Current Oncology.* 2022; 29(11):8846-8861.

Biography

Brandon Luck-Wold was born and raised in Colorado springs, co. He graduated magna cum laude with a BS in neuroscience and distinction in honors from Baylor University. He completed his MD/Ph.D., master's in clinical and translational research and the global health track at west Virginia University school of medicine. His research focus was on traumatic brain injury, neurosurgical simulation and stroke. At West Virginia University, he also served as a health coach for the diabetes prevention and management program in Morgantown and Charleston, WV, which significantly improved health outcomes for participants. In addition to his research and public health projects, he is a co-founder of the biotechnology company Wright-Wold scientific, the pharmaceutical company CTE cure and was a science advocate on capitol hill through the Washington fellow program.

He has also served as president of the WVU chapters for the American association of pharmaceutical scientists, the neurosurgery interest group and the Erlenmeyer initiative entrepreneur group. He was an active member of the gold humanism honor society and alpha omega alpha honor society. He is currently a member of the young neurosurgeons' committee.

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