Pharmaceutical and Therapeutics Sciences “PTS-2023”

Challenges and Hopes (10-11 May)

Towards Better Health Care

Menoufia ,Egypt

EGYPT VISION FOR
HEALTHCARE 2030

May 10th - 11th, 2023

ABSTRACT BOOKLET

Second International Pharmaceutical and Therapeutic Sciences Conference

Menoufia, Egypt.

May 10 th – 11th , 2023

Under Patronage

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About the Faculty of Pharmacy
Menoufia University

Our Vision

To be quality pioneers in pharmaceutical education, Research and Community Service on both national and regional levels.

Our mission

To improve health services in our community through providing comprehensive and advanced study programmes that ensure the graduation of professionally and morally distinguished pharmacists who are able to compete locally and globally. This will go hand in hand with developing scientific research that can serve and advance our pharmaceutical industry.

Welcome Message

You are cordially invited to attend the second international conference organized by the Faculty of Pharmacy at Menoufia University.

Through our strong sense of responsibility to the health and pharmaceutical care community - to provide a suitable platform for sharing pharmaceutical science expertise and defining the real state of patient problems.

Including a look at the options in light of the most recent national and international trends and treatment initiatives.
This year's conference will be a special entity within the conference that will cover all aspects of pharmaceutical and health science, from research, drug discovery, design, and synthesis to clinical drug use, controversies, and the future in all pharmaceutical specialties holding a recommendation session about industrial and clinical pharmacy in Practices.

Since the first PTS, the theme has been "international collaboration." This year, we will emphasize the need for collaboration and cooperation in implementing comprehensive pharmaceutical care strategies, sharing experiences on challenges and opportunities with colleagues from around the world, and working with international societies and high-level international experts to improve health care.

The International Scientific Conference will be placed on May 10 and 11, 2023, at the Menoufia University hotel. Keynote talks by top national and international speakers, oral presentations, and poster sessions provide an exceptional scientific program. We hope this conference will be both a scientific and social experience that leads to new relationships and research possibilities.
We look forward to welcoming you to this unique event.

Pharmaceutical and Therapeutics Science "PTS-2023"

Challenges and Hopes

Menoufia, Egypt, May, 10th – 11th, 2023

The Faculty of Pharmacy, Menoufia University is organizing its second international pharmaceutical sciences conference as a step towards achieving its vision of developing pharmaceutical scientific research, drug industry and enhancing health care services.

The main aim of this conference is to create distinguished links across the various facets of pharmaceutical science and practice. Therefore, pharmacists working as Researchers, educators, pharmaceutical industry, health care providers are all welcome to participate in the conference to exchange information and discuss issues relating to pharmaceutical sciences.

Keynotes, planetary lecturers and workshops are included in the conference with oral and poster presentations.

2nd International Conference
Faculty of Pharmacy Menoufia University

Scientific Committee

Prof. Maher El-Domiaty
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Mr. Mohamed El serwy

Table of contents

Invited speakers

Dr. Eng. Naoko Fukami
Director, Japan Society for the Promotion of Science (JSPS) Office in Cairo, Egypt

Director of Japan Society for the Promotion of Science Promotion Society (JSPS) office in Cairo since 2015. Prof. Fukami makes a project of Revitalization and Sustainability of Communities in Historic Cairo, supported by TOYOTA Fund from 2016 to 2018. She obtained her MSc from Tokyo Metropolitan University in 1981 about Islamic Architecture in Deccan from the 14th to the 17th century, and PhD from Yokohama National University in 1998 about Muqarnas, its origin and development. She was a Visiting Professor Institute of Oriental Culture from 1999 to 2001, University of Tokyo, making the Digital Archive: by the Mission for Indian History and Archaeology, University of Tokyo in 1959-1962. She was a Professor, Organization for Islamic Area Studies, Waseda University from 2012 to 2014, she joined the project of Islam and Multiculturalism.

Talk: Japan Society for the Promotion of Science (JSPS); Functions, Structures and Strategies

Prof. Ibrahim M. El-Sherbiny
Professor of Smart Nanomaterials & Nanomedicine
Zewail City of Science and Technology, Egypt

Dr. Ibrahim M. El-Sherbiny is a Tenured Full Professor of smart nanomaterials and nanomedicine, the Founding Chairman of Nano and Materials Sciences Programs, and the Founding Director of the Center of Materials Science (CMS) at Zewail City, Egypt. He earned his Ph.D. degree from Massey University, New Zealand. He conducted his post-doctoral at University of New Mexico and Texas University, USA. El-Sherbiny was honoured by many national and international universities and academies including the Academy of Scientific Research and Technology (ASRT), and Texas University, USA. He has more than 100 scientific papers published in high impact peer-reviewed journals, author of three books plus contribution to more than other 18 books, and more than fifteen review articles. He is also a named inventor on 24 patents in U.S., U.K., Japan, Europe and Egypt. Dr. El-Sherbiny is an editorial board member of many well-respected nano- and pharmaceutical journals.

Talk: Smart Nanomedicine Systems & Promises for Advanced Biomedical Applications; From Lab to Society

Prof. Ayman M. Noreddin.
Professor and Founding Dean, Faculty of Pharmacy, Galala University

Dr. Noreddin received his Ph.D. in Pharmaceutical Sciences from the University of the Pacific, California. He received his research training as a visiting scholar at the Department of Medicine, Stanford University. Dr.Noreddin had postdoctoral fellowship (Pharmacokinetics and Pharmacodynamics of Antimicrobials), Department of Medical Microbiology, the University of Manitoba, Canada followed by an American College of Clinical Pharmacy postdoctoral fellowship (Infectious Diseases). After receiving his American Leaders Fellow training by the American Council for Pharmacy Education (ACPE), Dr. Noreddin pursued leadership position as a Department Chair, Hampton University, VA then as an Associate Dean for Academic Affairs, Chapman University, CA. He moved to the UAE in order to serve as a Dean of Pharmacy, University of Sharjah. He is the Founding Dean of the Faculty of Pharmacy, Galala University. Prof. Noreddin is the Global Academic Pharmacy Leader, FIP/WHO, EMROPHARM Office.

Dr. Noreddin's research interest includes Pharmacokinetic/Pharmacodynamic modeling of anti-infective and anti-cancer therapy, clinical simulation and Monte Carlo analysis and bacterial resistance in biofilm studies. Dr. Noreddin has outstanding records of scientific and academic accomplishments with multiple research funding, numerous publications in highly prestigious journals and various presentations in both national and international conferences. He served as a scientific reviewer for the NIH as well as other national and international research institutions.

Talk: Branding Pharmacy via Education: A Community Service Encounter

The pharmacy profession is experiencing exciting times worldwide with evolving scope of practice in both hospital and community pharmacy settings. In the current presentation, we will have an outlook on the pharmacy evolution globally. A comparative study of the status of the pharmacy profession in Egypt compared to other advanced models of practice worldwide will be conducted. International Pharmaceutical Federation (FIP) global efforts to foster pharmacy practice will be discussed. A case study of branding pharmacy via education in Egypt will be discussed.

Talk: Combating Bacterial Resistance: A Public Health Encounter

Prof. Mohey_Elmazar

Professor and Chairman of Pharmacology &Toxicology

Professor and Chairman of Pharmacology Department, Mansoura University (1989), vice Dean (2001) & Dean (2003) of Faculty of Pharmacy, Helwan University, Founding Dean of Faculty of Pharmacy, Ahram Canadian University (2005, & 2007 to 2012), Founding Director of the Centre for Community & Consulting Services at BUE (2006). Prof. Elmazar is a member of several national & international scientific societies. He is also an editor and reviewer of several national & international scientific journals and recently received in 2023 the Inspirational Globe Magnitude
Award in its seventh international season in Cairo, Talented 7th. He has six international Patents. His Major research interests are in reproductive toxicology especially teratology. Prof. Elmazar has 169 publications (78 International Publications, h-index 21, total citation 1545, cumulative IF 204.78).
For all publications: please visit:

https://scholar.google.com/citations?user=A13929kAAAAJ&hl=en

https://www.researchgate.net/profile/Mohey_Elmazar

For International Publications, h-index, total citations: please visit: ……. https://www.scopus.com/authid/detail.uri?authorId=7003705674

IF 204.78).
Talk: Drug Development: Conceptional View and New Trends"

Prof. Naser Abd El Bary

Professor of clinical Oncology, faculty of medicine, Menoufia University

Talk: As a Pharmacist: Do I Have A Role In Cancer Control

Prof. Marihan Makld
Assistant professor/ Postdoctoral researcher at Pharmacology and Toxicology department at Mansoura University

Assistant professor/ Postdoctoral researcher at Pharmacology and Toxicology department at Mansoura University, also a Program Director of Professional Master in Immunity and Regenerative Medicine – Postgraduates program.

Talk: Healing the Future: Unleashing the Power of Professional Mastery in Immunology and Regenerative Medicine with the First Professional Master Program in Egypt

Prof. Mohey Hafez

عضو مجلس الشيوخ المصرى٢٠٢٠ و الرئيس المفوض لخدمات الرعاية الصحية والصناعات الدوائية لإتحاد دول شرق وجنوب افريقيا–الكوميسا و عضو مجلس الإدارة ورئيس شعبة الصناعات الدوائية بإتحاد الصناعات المصري و رئيس لجنة الصحة والدواء وعضوالمكتب التنفيذى بالإتحاد المصربلجمعيات ومؤسسات المستثمرين وكيل المجلس التصديرى للصناعات الطبية وأيضا رئيس شعبة الصناعات الدوائية ورئيس
لجنةالصحةوالصناعات الطبية بجمعية المستثمرين بمدينة العاشر من رمضان و عضو هيئة المكتب ولجنة التخطيط لقطاع التعليم الصيدلي بالمجلس الأعلى للجامعات و عضو مجلسكلية الصيدلة وعضولجنة التجارب والبحوث الصيدلية المتقدمة بجامعة عين شمس ور ئيس المركز الوطنى للتعليم المزدوج التكنولوجى–وزارة التربية والتعليم و مؤسس ونائب و رئيس مجلس امناءجامعة العاشر من رمضان

Talk: Health Committee For The Drug Strategy in Line with Egypt's Vision of Sustainable Development 2030

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Dr. Nadia Rashed Ali Al Mazrouei
Academic &Healthcare consultant

Assistant professor in Sharjah University in Pharmacy practice and pharmacotherapeutics Department since 2018 and considered as the 1st local employee from UAE joining the Pharmacy college. She has several publications, she is a member in WHO Expert Advisory Panel on international pharmacopoeia and pharmaceutical preparations and President of EMRO pharmaceutical Forum/FIP. Prior to that, she was Adjunct professor in UAE university/ Medicine and Health college in PharmD program from 2012-2016 which was the 1st professional program implemented in UAE. She was the Director of Healthcare Al Qudra Holding and a Board Member of Al Qudra Healthcare, the Healthcare investment arm of AQH, responsible for implementing the Healthcare sector strategy of Al Qudra Holding as well as scouting and managing the development of new business opportunities. Prior to joining Al Qudra Holding in 2013, Dr. Nadia was a Colonel/Deputy Commander of Armed forces Medical Services (MSC) considered as 1st Pharmacist getting this leadership position in UAE. Dr. Nadia was member and participating in major committees such as MSC Purchasing Committee, drug and therapeutic (P&T) committee, Medical Board Committee, Technical Committee, Administrative and Planning Committee, and supervising day to day operation in MSC. Before that, Dr. was Logistics Director of Directorate of Medical Services (DMS) and Chief pharmacist in Zayed Military hospital since 1985-2009 achieved and served in Military medical services as clinical and emergency pharmacist.

Talk: A Novel Educational Approach for Improving medication related problems in community pharmacies

Prof. Fayek Elkhwsky, Egyptian Emeritus Professor Biomedical Informatics& Medical Statistics and Biobanking

Dean Institute for Research and training in Reproductive Health 2005-2006,Professor of Community Medicine , King Saud University KSA 1996-2000, Professor of Community Medicine , Benghazi University Libya 2008-2014 Statistical Consultant Prince Salman for Research on Disability KSA 1998-2000. Prof. Fayek is a member of several national & international scientific societies. He is also Organizer and coordinator of professional MSc in Biobanking Ocrober **(The first in LMICs)**

Talk: The Gate of Critical Part of Pharmacogenomics & Precision Medicine

Prof. Mohamed Emam
Professor of clinical pharmacy, faculty of pharmacy, Beni-Suef University

Professor of clinical pharmacy, faculty of pharmacy, Beni-Suef University is one of the pioneers in clinical pharmacy in Egypt and the Middle East.He established department of clinical pharmacy in Beni-Suef University in 2009 after he got his PhD from UK. Prof. Mohamed have three published books one about aerosol medicine with springer and two about clinical pharmacy with Novapublisher. He have over 200 published papers since 2009.

Talk: Role of Clinical Pharmacist in Pharmacoeconomics

Prof. Gamal El-Maghraby
Professor and head of Pharmaceutical Technology, Faculty of Pharmacy, Tanta University.

Professor and head of Pharmaceutical Technology, Faculty of Pharmacy, Tanta University. He had a PhD in New drug delivery systems using liposomes from University of Bradford, UK. His research interest includes enhancement of bioavailability of drugs. This involved oral, transdermal and drug delivery studies. The research areas included crystalline structure modification for enhanced dissolution and permeability of drugs. The scope of his research also covers optimization of nanocarriers for enhanced bioavailability of drugs. Professor El Maghraby published 140 publications in reputable international journals in addition to publishing 11 book chapters. The research work of professor El Maghraby is highly cited which qualified him for inclusion in the top 2% of most cited worldwide scientists which is issued annually by Stamford university.

Talk: Melting Point Depression for Enhanced Dissolution Rate & Membrane Permeability of Drugs

Prof. Dr. Fotouh Mansour
Associate Professor Faculty of Pharmacy, Tanta University.

Associate Professor of Pharmaceutical Analytical Chemistry at Tanta University's Faculty of Pharmacy. With over 75 international publications, he has developed an impressive H-index of 21. Fotouh's research in pharmaceutical analysis and separation science has been recognized with several prestigious awards, including the State Encouragement Award. His dedication to advancing scientific research in his field was further acknowledged when he was named one of the World's Top 2% Scientists in analytical chemistry for 2021 by Stanford University's Ranking of the World Scientists. Fotouh's contributions to academia, coupled with his passion for driving innovative research, make him a leading figure in the scientific community.

Talk: Homemade Monolithic Columns for Pharmaceutical Analysis: The Potential and the Challenges

Prof. Samy Emara

Professor of Pharmaceutical Analytical Chemistry and the Dean at Faculty of Pharmacy, Misr International University, Egypt.

Professor of Pharmaceutical Analytical Chemistry and the Dean at Faculty of Pharmacy,
Misr International University, Egypt, he studied HPLC for his Ph.D. in professor Masujima's Laboratory (Hiroshima University, Japan) (1991) and attended the training courses on the application and maintenance of HPLC at Shimadzu Company (Kyoto, Japan) (1993). Following a JSPS Postdoctoral Fellowship (Japan, Hiroshima). He joined Professor Masujima's Laboratory and was working on Capillary Electrophoresis (1996). He participated in the development, research and manufacture of immediate and controlled/sustained release pharmaceutical products (College of Pharmacy, University of Cincinnati, USA) (1999). Prof Emara joined professor Masujima's Laboratory and was working on HPLC-MS (Hiroshima University, Japan) (2002),
He also has been invited as a visiting scientist in Riken (Osaka, Japan) to join professor Masujima's Laboratory in cooperative activities for Single Cell Mass Spectrometry and Live Single Cell Lipidomics and Metabolomics (2015)

Talk: Insight life through live single cell analysis by mass spectrometry

Cells are the building blocks that play vital roles in the functioning of living organisms. Analysis of a single cell's chemical composition and content is critical for assuring precise investigations of cellular metabolism and is an important part of lipidomic and proteomic studies. Furthermore, structural knowledge improves understanding of cell behavior as well as cellular and sub-cellular mechanisms. However, due to the very small size of each cell, as well as the enormous diversity and extremely low amounts of chemicals found in individual cells, single-cell analysis can be extremely challenging. Live single cell analysis is an area of research that has received considerable attention in recent years. An important aspect of live cell analysis lies in the requirement for such technology to provide non-perturbing measurements of cellular-level phenomena. Also, understanding cellular structures and dynamic processes are critical to addressing many questions of cell biology. Thus, live single cell analysis has revolutionized the way in which biologists study cells, proteins and a multitude of processes and molecular interactions. To sustain cell health while giving relevant information, live single-cell analytical approaches must have unique characteristics. We have developed single-cell methodology through the flexibility to combine live single-cell mass spectrometry and three-dimensional holographic and tomographic laser microscopy images to allow the inference of the precise volume and original location as well as the concentration of the trapped cell content. The resulting sample volume was 6.7 femtoliter and the total amount of trapped methionine sulfoxide was found to be 5.6 zeptomole

Dr. Gomaa A. M. Ali
Associate Professor Chemistry Department, Faculty of Science, Al-Azhar University, Assiut, Egypt

Associate Professor at the Chemistry Department, Faculty of Science, Al-Azhar University, Egypt. He has 15 years of experience working in the research areas of materials science, humidity sensing, graphene, supercapacitors, water treatment, and drug delivery. He was awarded his Ph.D. in Advanced Nanomaterials for Energy Storage from UMP, Malaysia. He is the recipient of some national and international prizes and awards such as TWAS-AREP (2018), Obada International Prize (2021), Arab Water Council Award 2022, Gold Medal (Archimedes, Russia, 2014), Green Technology Award (CITREX, Malaysia, 2015), Gold Medal (British Invention Show, UK, 2015). Dr Gomaa has been included in Stanford University's List of World's Top 2% of Scientists, Egypt. Dr. Gomaa has published over 137 journal articles and 22 book chapters on a broad range of cross-disciplinary research fields, including multifunctional materials, nanotechnology, supercapacitor, water treatment, humidity sensing, biosensing, corrosion, and drug delivery. So far, he has more than 4697 citations and an h-index of 42. Dr. Gomaa is an Editor of many international journals and a reviewer for more than 80 WoS journals. Dr. Gomaa is a member of national and international scientific societies, such as TWAS Affiliate, AAS Affiliate, the American Chemical Society, the Royal Society of Chemistry, the National Committee of Pure and Applied Chemistry, and the Egyptian Young Academy of Sciences, ASRT. He is an Editor of many handbooks such as "Waste recycling technologies for nanomaterials manufacturing" Springer, 2021, and "Handbook of Biodegradable Materials" Springer, 2022.

Talk: Nanomaterials for Electrochemical Energy Storage (Supercapacitors)

Prof. Dr. Hesham Salem.

Prof. Dr. Hesham Salem has over thirty years of experience in the field of Pharmaceutical Analytical Chemistry, Drug Analysis either in Pharmaceutical Dosage Forms or in Biological Fluids and Quality Control. In 1993, he earned his Ph.D. from the Faculty of Pharmacy, Zagazig University. Prof. Salem has published more than one hundred and fourteen scientific papers in international scientific journals. Prof. Salem award and attended more than thirty national and international conferences in several countries (Egypt, Thailand, London, Spain, Turkey, Tunisia, Malaysia, Morocco, Germany, Saudi Arabia, Jordan, Qatar, Syrian and Dubai). Dr. Hesham helps on supervision of thirty Ph.D. and M.Sc. thesis.

Talk: Green Analytical Chemistry

Utilization of a set of principles that reduces or eliminates the use and generation of hazardous substances in the design, manufacture and application of chemical products. The goal of green analytical chemistry is to use analytical procedures that generate less hazardous waste and that are safer to use and more benign to the environment. Analysis of recent publications concerning Green Analytical Chemistry shows the current trends and future needs in this area. Articles published since 2023 have focused mostly on improvements of analytical procedures aiming at greening the selected steps of the analytical process. Green chemistry is not a solution for all environmental problems but it is the most fundamental approach for preventing pollution

Prof. Wafaa Zahran
Prof. Medical Microbiology &Immunology, Faculty of Medicine, Menoufia University, Egypt

Current positions:

Prof. Medical Microbiology &Immunology, Faculty of Medicine, Menoufia University, Egypt

Director of Quality Assurance Center Menoufia University

Previous positions:

Dean Faculty of Pharmacy, Menoufia University. (2016- 2019)

Vice Dean for Education and Students Affairs Faculty of Medicine Menoufia University.

At the national level:

Member of the Scientific Council of the Egyptian Fellowship since 2008- present (board of infection control).

Authorized Reviewer, for National Authority for Quality Assurance and Accreditation of Education in Egypt.

Qualifications:

Bachelor (M.B.B.ch.), Ph.D Medical Microbiology, Professional Diploma infection control, Diploma of Medical Education, Total Quality Management Diploma from Federation of Arab Universities and TOT June 2021

Talk1: Climate Change and Threats of Infections: Do We Know What Is on The Horizon?

Talk 2: Climate Change & Threats of Infections: Do We Know What Is on the Horizon? (Lab to Society)

Prof. Ahmed Wahid
Professor and head of Pharmaceutical Biochemistry department, Faculty of Pharmacy, Alexandria University, Egypt.

Professor and head of Pharmaceutical Biochemistry department, Faculty of Pharmacy, Alexandria University, Egypt. In 2018 he founded the Pharmaceutical Biochemistry department in the Faculty of Pharmacy-Alexandria University. The undergraduate studies began in the department in 2019, and the bylaws for the postgraduate studies in the department were established in 2020. I also established the first Molecular Biology research lab. in the department in 2021. I established another Molecular Biology lab. In 2023. He has gained an experience in a wide range of biochemical, biophysical and virological techniques during my Ph.D. studies in Manchester University in the United Kingdom, Postdoc fellowship in the Center of Infection and Immunity, Pasteur institute in France, and academic visit to the Centre for Virus Research (CVR) in the University of Glasgow in Scotland. Three high profile research-led labs that allowed me to widen my scientific knowledge in these fields and helped me to develop skills necessary to obtain national/international intramural and extramural research funding for my own independent laboratory in Egypt. Since June 2018, he has heading a research team. The main focus of the team is to develop basic research in the field of preclinical drug/Translational biomarker discovery that may address underlying mechanisms that lead to susceptibility to some diseases and/or prediction of therapeutic response, with specific themes in the field of liver diseases and their clinically associated viral infections, that could be of potential use to help identify host/viral factors that are associated with treatment and/or diagnosis.His lab employs multidisciplinary approaches for drug discovery or interrogating fundamental mechanistic questions at the molecular, cellular, systems, and organismal levels.

Prof. wahid showed a strong record of publications with first and leading authorships in prestigious journals such as Nucleic acids research, Nature communications, Life sciences, Biomedicine and Pharmacotherapy, scientific reports, Journal of virology, and Journal of biological chemistry, etc.

Talk: Novel Pharmacogenomics Postgraduate Program, A Degree for The Future

Dr. Eman abdelrazek
Professor of clinical oncology
Head of clinical nutrition centre menofia hospital

Professor of clinical oncology & Head of clinical nutrition centre menofia hospital
Professor of nutrition in health care diploma faculty of pharmacy Tanta university
Professor of clinical nutrition module in faculty of health sciences technology menofia university
Professor of nutrition in palliative care unit in clinical oncology department menofia university

Talk: Nutritional Therapy & Clinical Nutrition

Prof Dr. Ibrahim El-Tantawy El Sayed, Director of The International Cooperation Office, Delta Technological University (DTU)

Professor of Organic and Medicinal Chemistry, Faculty of Science, Menoufia University, Egypt. He is a specialist in drug discovery and development, through chemical synthesis, of new drug for treatment of the world's deadliest diseases such as cancer & Malaria. He received his Ph.D. from MU and Aarhus University, Denmark. He spent many years of postdoctoral positions & as a visiting Professor at Austria, Japan, Sweden & Belgium. Currently he is the President of Japan Society for The Promotion of Science Alumni Association in Egypt (JSPSAAE) since 2012. He received many international awards including WHO Innovation Award for Developing Novel Anticancer Drug based on natural source. Currently he acts as a reviewer for many international journals & for the Promotion Committees of the Supreme Council of Egyptian Universities. Prof. Tantawy is a Board Member of International Green Technology Organization, Chinese Academy of Sciences.

Talk: An Efficient & Green Approach to Neocryptolepine Scaffolds as a Novel Antimalarial, Antischistosomal & Anticancer Agent

Prof. Hesham R. El-Seedi
Professor of Organic and Medicinal Chemistry, Faculty of Science, Menoufia University

Prof. of Organic and Medicinal Chemistry,Faculty of Science, Menoufia University working in isolation and structure elucidation of biologically active natural products from medicinal plants, marine, bee products, synthesis and biosynthesis. He is a fellow of JSPS, Keio University, Japan. Throughout his carrier, he worked in pioneer internationally recognized laboratories including Geneva University, Switzerland; KTH; Stockholm University, and Department of Pharmaceutical Biosynthesis, Uppsala University, Sweden. He has published more than **370** peer-reviewed international research articles and scientific papers, reviews, chapters in Peer-Reviewed International Journals among them: The **Lancet** (Current IF around **202.7**).He has presented his research at over 150 International scientific conferences worldwide and received awards and most recently:

Appreciation certificate from Keio University, **Japan** about his lectures and collaboration. **2015**: Award from STEFELSEN Foundation for Pharmacognosy: For many years of Scientific Contributions to Pharmacognosy Research and thereby increasing the knowledge about bioactive Natural Products and building contributions with Developing Countries, Visby, Sweden as well as several awards.

https://scholar.google.com.eg/citations?hl=en&user=KjGks3kAAAAJ&view_op=list_works

YouTube channel: https://www.youtube.com/channel/UCnwtgGw9zmKQ9TUF0qiH9lw/videos

Talk: The Perspectives Of Pharmacognosy Between Traditional And Contemporary Medicine: Will They Stay"?

Dr. Ehab El-Bendary

Dr. Ehab Mohamed Bendary MBA, Harvard Medical School Associate Deputy of Menoufia Pharmacists Syndicate Board Head of Training, Institutes & Research at Menoufia Directorate of Health Affairs - Menoufia (prev.)

Talk: New Trends in Pharmaceutical Fields Digitalization & AI - Real Stories

The Presentation emphasize on the following : Pharmacy and labor market . Pharmacy on the road of specialization through Chanege from B. Pharm to PharmD .Digital Health as New Trend in Pharmaceutical Field (Chat GPT, Digital Clinic, Robotic Pharmacy & precision Medicine program) Which are real examples of Digitalization and AI application in Digital Health Era

Prof. Mtthias Melzig
Professor of Pharmacology and Toxicology at the Institute of Pharmacy FUB

Professor of Pharmaceutical Biology at the Institute of Pharmacy at Freie Universität Berlin since October 2002. After studying Pharmacy and Experimental Pharmacology/Toxicology, he received his doctorate at the Department of Pharmacy at the University Greifswald in 1984 and habilitated five years later also at the University of Greifswald. Shortly after, he became Head of the Department for Molecular and Cellular Pharmacology/Enzymology and Receptorology at the Institute of Drug Research (Berlin) in January 1990, followed by an appointment as Head of the Research Group Cellular and Biochemical Pharmacology, Institute for Molecular Pharmacology (Berlin) from January 1992 until March 1996. In April 1996, he became Professor for Pharmaceutical Biology at the Institute of Pharmacy at Humboldt-University Berlin. Since October 2002, he has been Professor for Pharmaceutical Biology at the Institute of Pharmacy at Freie Universität Berlin, where he held the position as Executive Director for ten years (2009–2019). Matthias F. Melzig is Member of the Executive Committee of the European Tissue Culture Society, the German Homeopathic Pharmacopoeia Commission, and Chairmen of the Committee for Analytics of the German Homeopathic Pharmacopoeia Commission.
His research focuses on natural product pharmacology, phytomedicine and natural product characterization. The emphasis is on the investigation of medicinal plants used in traditional and folk medicine to elucidate their biological activity and mode of action. He is especially interested in finding new inhibitor of enzymes (proteases, amylases, lipases and other hydrolases) as well as the mode of action of selected triterpenoid compounds, mainly saponins and triterpenoic acids.

Talk: Natural products from plants and traditional European herbal medicine

Prof. Burkhard Kleuser
Professor of Pharmacology and Toxicology at the Institute of Pharmacy FUB

Professor of Pharmacology and Toxicology at the Institute of Pharmacy at Freie Universität Berlin since mid-July 2020. Previously, Burkhard Kleuser was the Chair of Toxicology at the University of Potsdam. After studying food chemistry and biochemistry he completed his doctorate at the Institute for Biochemistry and Molecular Biology at the University of Hamburg. A scholarship from the German Research Foundation took him to the Georgetown University Medical Center in Washington D.C. In the research group of Prof. Dr. Sarah Spiegel, he was involved in the discovery of sphingosine 1-phosphate as a bioactive molecule. Today it is known that this molecule is essential for the circulation of lymphocytes in the organism. Burkhard Kleuser returned from the USA to the Institute of Pharmacy at the Freie Universität Berlin, where he habilitated in 2002, received permission to teach in the field of toxicology and pharmacology and held a professorship in pharmacology and toxicology from 2006. In 2009, he accepted the appointment to the Chair of Toxicology at the University of Potsdam. From 2013 to 2018, he remained closely associated with the Department of Biology, Chemistry, Pharmacy at Freie Universität Berlin as deputy spokesperson of the DFG Collaborative Research Centre 1112 "Nanocarriers: Architecture, Transport and Targeted Delivery of Active Substances for Therapeutic Applications" - as well as in his role as co-spokesperson of the BMBF research platform "Berlin-Brandenburg Research Platform BB3R".

Talk: Sphingolipids in immunology and type 2 diabetes

Dr. Fabian Schumacher
Professor of Pharmacology and Toxicology
Head of Pharma-MS unit at the Institute of Pharmacy FUB

Professor of Pharmacology and Toxicology & Head of Pharma-MS unit, Institute of Pharmacy FUB: Dr. Schumacher earned his bachelor's (2007) and master's (2009) degrees in chemistry from the University of Leipzig. From 2009 to 2013, he worked on his doctoral thesis in the field of molecular toxicology at the German Institute of Human Nutrition Potsdam-Rehbruecke (DIfE) under the supervision of Prof. Dr. Glatt. He then continued his scientific career as a postdoctoral fellow until 2020 in a collaboration between the Departments of Nutritional Toxicology at the University of Potsdam (Prof. Dr. Kleuser) and the Institute of Molecular Biology at the University of Duisburg-Essen (Prof. Dr. Gulbins). In 2020, Dr. Schumacher joined Prof. Kleuser at the Freie Universität Berlin as a research associate. Here he is responsible for the Pharma-MS core-facility subunit. This is a unit for qualitative and quantitative mass spectrometry in the context of pharmaceutical research located at the Institute of Pharmacy, FUB. The scientific focus of Dr. Schumacher is on liquid chromatography - mass spectrometry (LC-MS) and its application to study the influence and metabolism of sphingolipids in diseases and other pathological conditions. In this field, Dr. Schumacher has published in numerous renowned journals and many national and international research groups seek his expertise.

Talk: The potential of mass spectrometry in life sciences- A selection of personal research topics

Dr. Ahmed Hassan
Postdoctoral researcher, Department of Pharmacology and Toxicology at Institute of Pharmacy FUB

Dr. Ahmed A. Hasan, Postdoctoral researcher, Department of Pharmacology and Toxicology at Institute of Pharmacy FUB: Dr. Hasan earned his bachelor's degree in pharmaceutical sciences (2007) and his master's degree in biochemistry (2012) from the Faculty of Pharmacy, Zagazig University, Egypt. Dr. Hasan received a DAAD scholarship to get his PhD degree under the supervision of Prof. Kleuser at the University of Potsdam, Germany and he got his doctoral degree in 2018. Afterward, Dr. Hasan continued his research career as a postdoctoral researcher at University of Potsdam until 2020, then he joined the research group of Prof. Kleuser at FUB by the end of 2020. The focus of Dr. Hasan's research is cardiorenal and metabolic diseases where he tries to investigate the underlying molecular mechanisms and identify potential pharmacological targets to be able to suggest improvements of the currently used management approaches of such disorders. Dr. Hasan has a long track record of expertise in animal studies and different state-of-the-arte biological techniques proven by his long list of publications in internationally recognized scientific journals.

Talk: Cardiorenal and metabolic disorders- Genetic and epigenetic insights

Eng.Mohamad Yasser Elfaramawy
Petroleum production engineer

Eng. Mohamad is a petroleum production engineer, working for Badr Eldein Petroleum Company (BAPETCO) for 2 years after graduation from faculty of petroleum and mining engineering in 2019 and finishing his military service in 2021. He lead the biggest student chapter in his university, Suez University, “Society of Petroleum Engineers” student chapter after being elected. He worked as a university ambassador for the British Council. He delivered introductory sessions about IELTS preparation. He presented his faculty in Alexandria Bibliotheca’s main event, “Sketch Your Future” dedicated for high school students, for 4 years. He had many technical and non-technical internships in various prestigious companies such as Schlumberger,ADES, GIZ, etc

Talk: Conference presentation skills

WORKSHOPs

1. Biobanking & Clinical Pharmacogenomics PGx (From theoretical to clinical application)

- Pharmacogenomics focuses on how our genetic profile affects our response to medicine.
- Until recently, drugs have been developed with the idea that each drug works the same for everybody. However, pharmacogenomics research has changed the slogan from "one size fits all" to "right drug for the right patient at the right dose," which means more personalized approaches.

Biobanking & Clinical Pharmacogenomics PGx: From Theoretical to Clinical Application" aims to provide a comprehensive overview of the fundamental concepts of pharmacogenomics and Biobanking, their role in personalized medicine, and their practical applications in clinical settings.

- The workshop will begin with an introduction to PGx and basic genetics to help participants understand the underlying principles of pharmacogenomics. It will then cover the basics and importance of Biobanking, including the different types of biobanks and their uses.
- The third session will focus on Biobanking and PGx in personalized medicine. Participants will learn how biobanks can help identify genetic variations associated with drug response and how PGx testing can predict patient outcomes and optimize drug therapy.
- The fourth session will explore clinical pharmacogenomics, including the interpretation and application of PGx testing in clinical settings, the integration of PGx results into electronic health records, and the challenges of implementing PGx testing in routine clinical practice.
- Finally, the workshop will conclude with a discussion of bioinformatics in pharmacogenomics. Participants will learn about the various bioinformatics tools and databases available for PGx research, data analysis, and interpretation.

By the end of this workshop, participants will have gained a comprehensive understanding of the fundamentals of pharmacogenomics and Biobanking and their practical applications in personalized medicine. They will be able to:

- Understand the underlying principles of pharmacogenomics and basic genetics
- Appreciate the importance of Biobanking and the different types of biobanks available
- Understand the role of Biobanking and PGx toward personalized medicine
- Interpret and apply PGx testing in clinical settings
- Appreciate the challenges of implementing PGx testing in routine clinical practice

• Be familiar with the bioinformatics tools and databases available for PGx research, data analysis, and interpretation.

Overall, this workshop will equip participants with the knowledge and skills necessary to use pharmacogenomics and Biobanking to optimize drug therapy and improve patient outcomes.

Chairmans: -	❖ **Prof. Fayek El-Khwsky** ❖ **A.Prof. Sameh Farrag** ❖ **Prof. Elodie Caboux** ❖ **Prof. Abeir Shalaby** ❖ **Dr. Ahmed Khoder** ❖ **Dr. Mahmoud Nazih**
Introduction to PGx & Basic Genetics **25 min**	**Dr. Ahmed Khoder** • **American Board Instructor & Scientific Office Member Egyptian Society of Pharmacogenomics and Personalized Medicine (ESPM)**
Basics & importance of Biobanking 30 min	**Prof. Elodie Caboux** • **Assistant-Biobank Process Mgt.** **Laboratory Support, Biobanking, and Services**
Biobanking & PGx toward PM 30 min	**Prof. Fayek El-Khwsky** • **Professor of Biomedical Informatics, Medical Statistics & Biobanking at Institute of Medical Research - Alexandria University**
Clinical pharmacogenomics 40 min	**Prof. Sameh Farrag** • **Professor of Genetic & Pediatrics at First Faculty of Medicine Charles University Prague, Czech Republic** **Dr. Mahmoud Nazih** • **American Board Instructor & Scientific Office Member Egyptian Society of Pharmacogenomics and Personalized Medicine (ESPM)**
Bioinformatics in pharmacogenomic 1.30 hrs	**Prof. Abeir Shalaby** • **Vice Dean of the Institute of Biotechnology for postgraduate studies and Research, Professor of Biochemistry and Molecular Biology, Veterinary Medicine Suez Canal University.**

2. Drug Design & Discovery Software

(From research to pharmacological application))

- This workshop will highlight variable computer-aided drug design (CADD) software, databases, and web services to help you research medicinal chemistry. These tools are classified according to their application field, trying to cover the whole drug design pipeline. Our focus is to help early-career participants effectively use these tools to design their next drug molecules using structure and/or ligand-based drug design approaches. Additionally, we will refer to free resources for the biological screening of synthesized molecules, particularly in cancer research. Finally, we will discuss several options for studying abroad in medicinal chemistry.
- This workshop will focus on the real-life research scenario applications of computational drug design. Participants will learn about the various techniques and tools used in computational drug design, including molecular docking, DFT, and Pharmacophore. The workshop will also cover the challenges and limitations of computational drug design and how to overcome them. By the end of the workshop, participants will have a comprehensive understanding of computational drug design and its potential applications in drug discovery.

(9 MAY – 2023 – 4:30 PM → Online Zoom Meeting)

Chairmans: -	✓ **Associate Professor Mona said Fathy El-Zoghbi.** ✓ **Associate Professor. Essam Eldin A. Osman** ✓ **Lecturer: Dr. Mohamed Ahmed El-Tabakh**
Click 2 Drug	**Prof. Essameldin Osman** • **Associate Professor of Pharmaceutical Chemistry Faculty of Pharmacy, Cairo University** • **Visiting Assistant Research Scientist College of Pharmacy, University of Michigan, USA.**
Computational Drug Design (Real-Life Research Scenario Applications)	**Prof. Mohamed El-Tabakh** • **Professor of Molecular Biology Faculty of Science Al-Azhar University**

3. Nutritional Therapy & Clinical Nutrition (Role of nutrition in a cancer patient)

- Nutritional therapy plays an important role in the management of cancer patients. This workshop aims to provide an overview of the role of nutrition in cancer patients, focusing on two specific cases. The first case is a female patient diagnosed with a cancer lip who presented with a large fungating mass extending to the nose and underwent concurrent chemoradiotherapy. The second case is a male patient diagnosed with familial adenomatous polyposis (FAP) who underwent total colectomy with resection of the ileocecal valve and presented with weight loss and diarrhea due to short bowel syndrome. In both cases, the importance of nutrition assessment and intervention was discussed, emphasising personalized nutritional therapy to meet each patient's specific needs.

- The workshop began with an introduction to the role of nutrition in cancer patients and the various factors that can affect nutritional status, including cancer itself, cancer treatment, and comorbidities. The calculation of nutrient requirements based on body weight and activity level was also discussed.

- The first case presentation highlighted the challenges of managing nutrition in a patient with a large facial tumor and undergoing concurrent chemoradiotherapy. The nutritional assessment revealed significant malnutrition, and the patient required individualized nutrition therapy, including enteral feeding, to achieve adequate nutrient intake and prevent further weight loss.

- The second case presentation focused on the management of short bowel syndrome in a patient with FAP. The nutritional assessment revealed significant nutrient deficiencies, and the patient required tailored nutritional interventions, including enteral feeding and micronutrient supplementation, to manage his symptoms and prevent further weight loss.

Overall, the workshop emphasized the importance of personalized nutrition therapy in cancer patients and the need for ongoing nutritional assessment and intervention to optimize patient outcomes.

Outcome:

- The workshop provided participants with a deeper understanding of the role of nutrition in cancer patients and the challenges of managing nutritional status in patients undergoing cancer treatment or with comorbidities. The case presentations provided practical examples of how nutritional assessment and intervention can be tailored to meet each patient's individual needs, highlighting the importance of personalized nutrition therapy. The workshop also allowed participants to discuss their own experiences and challenges in managing the nutrition of cancer patients, facilitating knowledge sharing and collaboration among participants.

(10 May – 2023 –UNIVERSITY HOTEL – SHBIEN ELKOOM)

Moderator of Work Shop

❖ **Prof.Dr. Eman Abdelrazik**

CHAIRMANS: -	❖ **PROF.DR ENAS ELKHOULY** ❖ **A.PROF. OLFAT MAHMOUD NASSAR**
INTRODUCTION 25 min	**A.PROF. AMIRA EL-DESOUKY** • **ASSISTANT PROFESSOR OF CLINICAL ONCOLOGY FACULTY OF MEDICINE MENOFIA UNIVERSITY**
CALCULATION 30 min	**PROF. EMAN ABDEL-RAZEK** • **PROFESSOR OF CLINICAL ONCOLOGY AT FACULTY OF MEDICINE – MENOUFIA UNIVERSITY**
CANCER LIP CASE 30 min	**PROF. EMAN ABDEL-RAZEK** **PROFESSOR OF CLINICAL ONCOLOGY AT FACULTY OF MEDICINE – MENOUFIA UNIVERSITY** **DR HEBA ABDEL-AZIZ** • **DEMONSTRATOR OF CLINICAL ONCOLOGY FACULTY OF MEDICINE AT MENOUFIA UNIVERSITY** • **CASE ONE: FEMALE PATIENT DIAGNOSED WITH CANCER LIP PRESENTED WITH A LARGE FUNGATING MASS EXTENDING TO HER NOSE AND RECEIVED CCRT SENT FOR NUTRITION ASSESSMENT**
SHORT BOWEL SYNDROME CASE 30 min	**PROF. EMAN ABDEL-RAZEK** • **PROFESSOR OF CLINICAL ONCOLOGY AT FACULTY OF MEDICINE – MENOUFIA UNIVERSITY** **DR MOHAMED SHALABY** • **ASSISTANT LECTURER OF CLINICAL ONCOLOGY** • **FACULTY OF MEDICINE - MENOUFIA UNIVERSITY** **CASE TWO : MALE PATIENT DIAGNOSED AS FAP UNDERWENT TOTLA COLECTOMY WITH RESECTION OF ILIOCECAL VALVE PRESENTED WITH WEIGHT LOSS AND DIARHEA WITH SHORT BOWL SYNDROME**

4. CE workshop

This workshop on capillary electrophoresis (CE) is designed to provide participants with a comprehensive understanding of the theory, principles, and practical applications of this powerful analytical technique. CE is a widely used separation method that allows

the analysis of a wide range of molecules, including proteins, peptides, nucleic acids, and small molecules. The workshop will cover basic topics related to capillary electrophoresis such as instrument setup and calibration, theoretical understanding of capillary electrophoresis, and method optimization. By the end of the workshop, participants will have gained the profound knowledge required to understand capillary electrophoresis effectively as the first step to digging deeply into CE research and analytical work.

Moderator of Work Shop

Dr Yousef El-Shamy

Yousef Elshamy is a Ph.D. candidate at C. Eugene Bennett Department of Chemistry at West Virginia University (WVU), USA. I graduated from the faculty of pharmacy in Egypt in 2014, and completed my master's degree in pharmaceutical analytical chemistry, in 2020. Currently, I am working as a Research Assistant (RA) at the Department of Chemistry at WVU. My scientific passion is for analytical separation techniques and spectroscopy analytical methods. In my master's work, I focused on chromatographic techniques together with UV-Vis spectrophotometric, and fluorometric methods. In my Ph.D., I am currently working on capillary electrophoresis (CE) coupled with mass spectrometry (MS) using vibrating sharp-edge spray ionization (VSSI) as a new promising ionization interface to analyze small molecules such as pharmaceuticals and metabolites by CE-MS. As I am originally a pharmacist, my goal is to work in the pharmaceutical industry after getting my Ph.D. degree.

Analytical chemistry

Sulfur and nitrogen co-doped carbon quantum dots as fluorescent probes for determination of some pharmaceutically-important nitro compounds

Galal Magdy[a], **Shaimaa Ebrahim** [a], Fathalla Belal [b], Ramadan A. El-Domany [c], Ahmed M. Abdel-Megied [a,d]

[a] *Department of Pharmaceutical Analytical Chemistry, Faculty of Pharmacy, Kafrelsheikh University, Kafrelsheikh, P.O. Box 33511, Egypt.*

[b] *Department of Pharmaceutical Analytical Chemistry, Faculty of Pharmacy, Mansoura University, Mansoura, P.O. Box 35516, Egypt.*

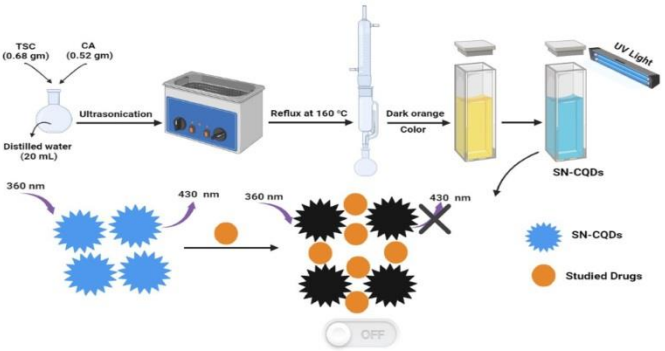
[c] *Department of Microbiology and Immunology, Faculty of Pharmacy, Kafrelsheikh University, Kafrelsheikh, P.O. Box 33511, Egypt*

[d] *Department of Pharmaceutical Sciences, Notre Dame of Maryland University, School of Pharmacy, Baltimore, MD 21210, USA*

Abstract

In this study, highly fluorescent sulfur and nitrogen co-doped carbon quantum dots (SN-CQDs) were synthesized by a simple one-pot hydrothermal method using thiosemicarbazide and citric acid as starting materials. Various spectroscopic and microscopic techniques were applied to characterize the prepared SN-CQDs. The synthesized SN-CQDs' maximum fluorescence emission was obtained at 430 nm after excitation at 360 nm. Rifampicin (RFP), tinidazole (TNZ), ornidazole (ONZ), and metronidazole (MNZ) all quantitatively and selectively quenched the SN-CQDs' native fluorescence, which was the base-for their-spectrofluorimetric estimation without the need for any tedious pre-treatment steps or high-cost instrumentation. SN-CQDs demonstrated a "turn-off" fluorescence response to RFP, TNZ, ONZ, and MNZ over the ranges of 1.0–30.0, 10.0–200.0, 6.0–200.0, and 5.0–100.0 µM with detection limits of 0.31, 1.76, 0.57, and 0.75 µM and quantitation limits of 0.93, 5.32, 1.74, and 2.28 µM respectively. The suggested method was successfully used to determine the investigated drugs in their commercial dosage forms. The method was further extended to their determination in spiked human plasma samples, with satisfactory mean % recoveries (99.44–100.29) and low % RSD values (< 4.52). The mechanism of fluorescence quenching was studied and discussed. The suggested method was validated in accordance with ICH recommendations.

Graphical abstract



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Biography

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Development of UPLC method for simultaneous assay of some COVID-19 drugs utilizing novel instrumental standard addition and factorial design

Hanan I. EL-Shorbagy[a], Mona A. Mohamed[b], Alaa M. El-Gindy[a], Ghada M. Hadad[a], Fathalla F. Belal[c]

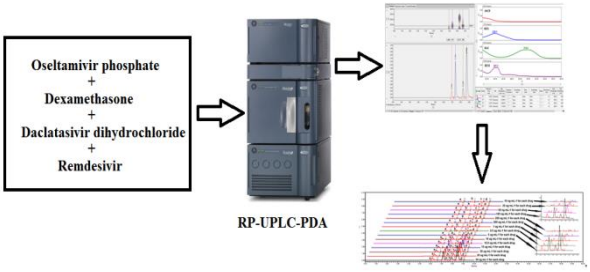
[a] Pharmaceutical Analytical Chemistry Department, Faculty of Pharmacy, Suez Canal University, Ismailia 41522, Egypt.
[b] Pharmaceutical Chemistry Department, Egyptian Drug Authority (EDA), Cairo, Egypt.
[c] Department of Pharmaceutical Analytical Chemistry, Faculty of Pharmacy, Mansoura University, Mansoura 35516, Egypt.

Abstract

A green, rapid, and simple RP-UPLC method was developed and optimized by full factorial design for the simultaneous separation of oseltamivir phosphate, daclatasivir dihydrochloride, and remdesivir, with dexamethasone as a co-administered drug. The separation was established on a UPLC column BEH C_{18} 1.7 µm (2.1 X 100.0 mm) connected with a UPLC pre-column BEH 1.7 µm (2.1 X 5.0 mm) at 25 ^{o}C with an injection volume of 10 µL. The detector (PDA) was set at 239 nm. The mobile phase consisted of methanol and ammonium acetate (8.1818 mM) in a ratio of 75.7: 24.3 (v/v). The flow rate was set at 0.048 mL min^{-1}. The overall separation time was 9.5 minutes. The retention times of oseltamivir phosphate, dexamethasone, daclatasivir dihydrochloride, and remdesivir were 6.323 ± 0.145, 7.166±0.036, 8.078±0.124, and 8.572± 0.166 minutes (eight replicates), respectively. The proposed method demonstrated linearity in the ranges of 10.0-500.0 (ng mL^{-1}) and 0.5-30.0 (µg mL^{-1}) for oseltamivir phosphate, 50.0-5000.0 (ng mL^{-1}) for dexamethasone, 25.0-1000.0 (ng mL^{-1}) and 0.5-25.0 (µg mL^{-1}) for daclatasvir dihydrochlorde, and 10.0-500.0 (ng mL^{-1}) and 0.5-30.0 (µg mL^{-1}) for remdesivir. The coefficients of determination (R^2) were greater than 0.9999, with percentage recoveries greater than 99.5% for each drug. The limits of quantitation were 6.4, 1.8, 7.8, and 1.6 ng mL^{-1}, and the limits of detection were 1.9, 0.5, 2.0, and 0.5 ng mL^{-1} for oseltamivir phosphate, dexamethasone, daclatasivir dihydrochloride, and remdesivir, respectively. The average content and uniformity of dosage units in the studied drugs' dosage forms were determined. Two novel methods were established in this work. The first method was used to assess the stability of standard solutions. This novel method was based on the slope of regression equations. The second was to evaluate the excipient's interference using an innovative instrumental standard addition method. The novel instrumental standard addition method was performed using the UPLC instrument program. It was more accurate, sensitive, time-saving, economical, and eco-friendly than the classic standard addition method. The results showed that the proposed method can estimate the tested drugs' concentrations without interference from their dosage form excipients. According to the Eco-score (more than 75), the Green Analytical Procedure Index (GAPI), and the AGREE criteria (total score of 0.77), the suggested method was considered eco-friendly.

Graphical abstract

Steps of RP-UPLC analysis of the tested drugs



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Biography: Corresponding author: Hanan I. EL-Shorbagy
Corresponding author's affiliation: Pharmaceutical Analytical Chemistry Department, Faculty of Pharmacy, Suez Canal University, Ismailia 41522, Egypt. Email: PGS.202214@pharm.suez.edu.eg Phone: 01005321910

Spectrofluorometric determination of cinacalcet hydrochloride: greenness assessment and application to biological fluids and *in-vitro* dissolution testing.

Mona H. Abo Zaid [1,2]*, Nahed El-Enany[3,4], Aziza E Mostafa[2], Ghada M Hadad[2], Fathalla Belal[4]

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[2] Pharmaceutical Analytical Chemistry Department, Faculty of Pharmacy, Suez Canal University, Ismalia, 41522, Egypt.
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[4]Pharmaceutical Analytical Chemistry Department, Faculty of Pharmacy, Mansoura University, Mansoura, 35516, Egypt

Abstract

A facile, simple, green and sensitive spectrofluorometric method was developed for determination of cinacalcet hydrochloride. The drug showed high native fluorescence intensity at 320 nm after excitation at 280 nm. The method was linear over the range of 5.0-400.0 ng/mL with LOD and LOQ values of 1.19 and 3.62 ng/mL, respectively. The proposed method was successfully applied for determination of cinacalcet in spiked human plasma samples. Two recent greenness metrics (GAPI and Analytical Eco-Scale) were chosen to prove the eco-friendly nature of the method. Furthermore, the proposed method was successfully applied to dissolution study of commercial cinacalcet tablets. The interference likely to be introduced by some commonly co-administrated drugs such as metoprolol and itraconazole was studied; the tolerance limits were calculated.

Green Synchronous Spectrofluorimetric Method for the Simultaneous Determination of Agomelatine and Venlafaxine in Human Plasma at Part per Billion Levels

Galal Magdy [a*], Fathalla Belal [b], Asmaa Kamal El-Deen [b]

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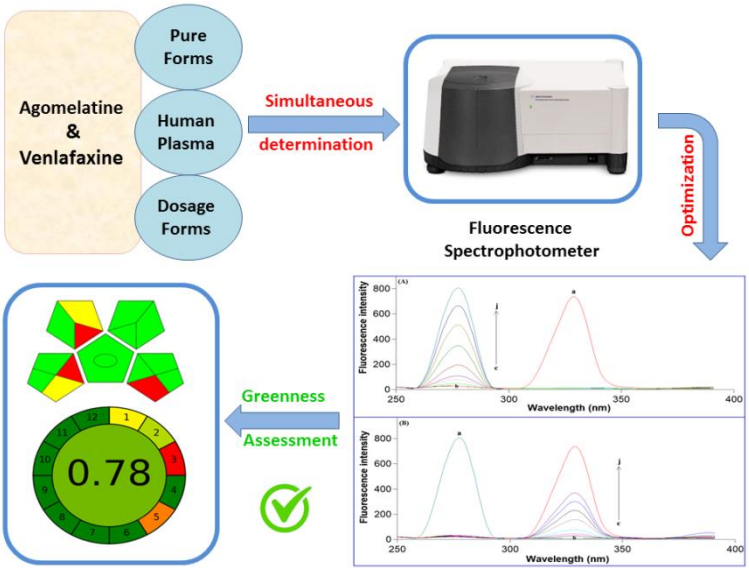
[b] *Pharmaceutical Analytical Chemistry Department, Faculty of Pharmacy, Mansoura University, Mansoura, 35516, Egypt.*

Abstract

A novel sustainable, simple, sensitive, and green spectrofluorimetric method was developed for the concurrent estimation of venlafaxine and agomelatine in pharmaceuticals and biological fluids. The method relies on synchronous fluorescence spectroscopy, where venlafaxine and agomelatine were measured at 276 and 328 nm, respectively, using Δλ of 20 nm. The potential factors affecting the fluorescence intensity were optimized by the one-factor-at-a-time (OFAT) strategy, where synchronous fluorescence intensity was significantly enhanced using a 1% w/v sodium dodecyl sulfate micellar system. The method was fully validated and exhibited excellent linearity (R^2 > 0.999 for both drugs) with very low limits of detection (LODs) in the range of 0.14-0.84 ng/mL. Consequently, the proposed approach was efficiently adopted to analyze the co-administered drugs in their pharmaceuticals and in spiked human plasma with excellent % recovery between 97.4 and 102.2 %. Finally, the method's greenness was evaluated using different metric tools, including Green Analytical Procedure Index (GAPI) and Analytical GREEnness (AGREE), which proved its excellent greenness.

Graphical abstract



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Biography:

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Green synthesis, characterization, and antimicrobial applications of silver nanoparticles as fluorescent nanoprobes for the spectrofluorimetric determination of ornidazole and miconazole

Galal Magdy[a], **Eman Aboelkassim** [a], Fathalla Belal [b], Ramadan A. El-Domany [c]

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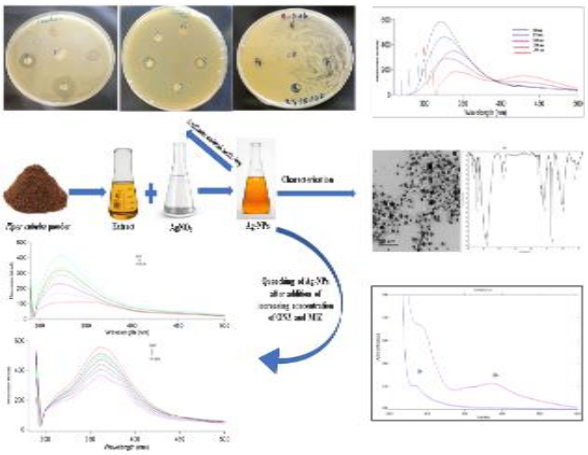
[b]Department of Pharmaceutical Analytical Chemistry, Faculty of Pharmacy, Mansoura University, Mansoura, P.O. Box 35516, Egypt.
[c]Department of Microbiology and Immunology, Faculty of Pharmacy, Kafrelsheikh University, Kafrelsheikh, P.O. Box 33511, Egypt

Abstract

A green and simple method was proposed for the synthesis of silver nanoparticles (Ag NPs) using Piper cubeba seed extract as a reducing agent for the first time. The prepared Ag NPs were characterized using different spectroscopic and microscopic techniques. The obtained Ag NPs showed an emission band at 320 nm when excited at 280 nm and exhibited strong green fluorescence under UV light. The produced Ag NPs were used as fluorescent nanosensors for the spectrofluorimetric determination of ornidazole (ONZ) and miconazole nitrate (MIZ) based on their quantitative quenching of Ag NPs native fluorescence. The current study introduces the first spectrofluorimetric method for the determination of the studied drugs using Ag NPs without the need for any pre derivatization steps. Since the studied drugs don't exhibit native fluorescent properties, the importance of the proposed study is magnified. The proposed method displayed a linear relationship between the fluorescence quenching and the concentrations of the studied drugs over the range of 5.0–80.0 µM and 20.0– 100.0 µM with limits of detection (LOD) of 0.35 µM and 1.43 µM for ONZ and MIZ, respectively. The proposed method was applied for the determination of ONZ and MIZ in different dosage forms and human plasma samples with high % recoveries and low % RSD values. The developed method was validated according to ICH guidelines. Moreover, the synthesized Ag NPs demonstrated significant antimicrobial activities against three different bacterial strains and one candida species. Therefore, the proposed method may hold potential applications in the antimicrobial therapy and related mechanism research.

Graphical abstract



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Mathematical Processing of Absorption as Green Smart Spectrophotometric Methods for Concurrent Assay of Hepatitis C Antiviral Drugs, Sofosbuvir and Simeprevir: Application to Combined Pharmaceutical Dosage Forms and evaluation of the method greenness

Sayed M Derayea[1], Amal E. Hamad[2], **Bassam Shaaban Mohammed*[2]**

[1] Department of Analytical Chemistry, Faculty of Pharmacy, Minia University, Minia 61519, Egypt

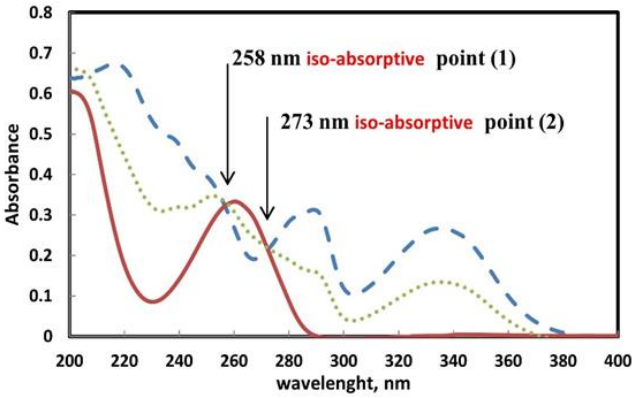
[2] Department of Analytical Chemistry, Faculty of Pharmacy, Menuofia University, Shebin El Kom Menoufia, Egypt

Abstract

The present work was developed to create three rapid, simple, eco-friendly, cheap spectrophotometric methods for concurrent assay of Sofosbuvir (SOF) and Simeprevir (SMV) in their pure, laboratory prepared mixture and pharmaceutical dosage form with high degree of accuracy and precision. Three methods were developed including isosbestic point, ratio subtraction and dual wavelength. The linear range of the proposed methods was 3–50 and 2–50 µg mL-1 for SMV and SOF, respectively. The proposed methods were validated according to ICH guidelines in terms of linearity, accuracy, precision, limit of detection and limit of quantitation. The proposed approach is highly simple and the procedure is environmentally green making it suitable for the drug analysis in routine works.

Key Words: Simeprevir; Sofosbuvir; Isosbestic point method; Ratio subtraction method; Dual wavelength method; Combined Pharmaceutical Dosage Forms

Graphical Abstract



Zero order spectra with two points of intersection of (—) SOF 20 µg mL-1, (– – –) SMV 20 µg mL-1 and (·····) mixture containing (10 µg mL-1) of each drug

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Synthesis of Ag-doped ZnO Nanorods with Peroxidase-like Activity for Colorimetric Detection of Hydrogen Peroxide

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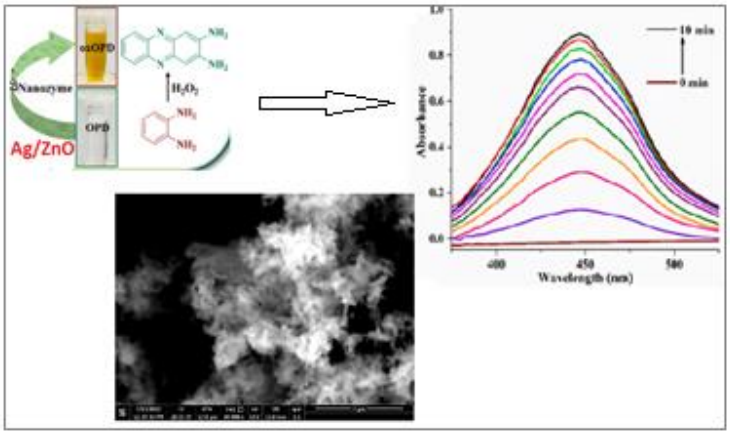
Abstract

Nanozymes which are nanomaterials with intrinsic enzyme-like characteristics have been gaining much research interest for the design of both colorimetric and electrochemical sensors for the point-of-care diagnostic applications. In the current work, zinc oxide integrated with silver (5wt.% Ag/ZnO) was prepared via simple chemical co-precipitation approach. The structure, purity, and molecular interaction of the synthesized nanocomposite were examined by SEM and XRD techniques. The XRD of Ag/ZnO showed a polycrystalline structure of binary phases. SEM showed the synthesized Ag/ZnO having surface morphology of nanorod like structure with large surface to volume area and aspect ratio. The as prepared Ag/ZnO nanorods exhibit a peroxidase-like activity towards o-phenylenediamine oxidation in the presence of H2O2. Then a sensitive and selective colorimetric sensing platform was constructed for detecting hydrogen peroxide. The current work has potential application for colorimetric detection of various biomarkers such as choline, glucose and uric acid.

Graphical abstract



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Application of sulfur and nitrogen doped carbon quantum dots as sensitive fluorescent nanosensors for the determination of saxagliptin and gliclazide

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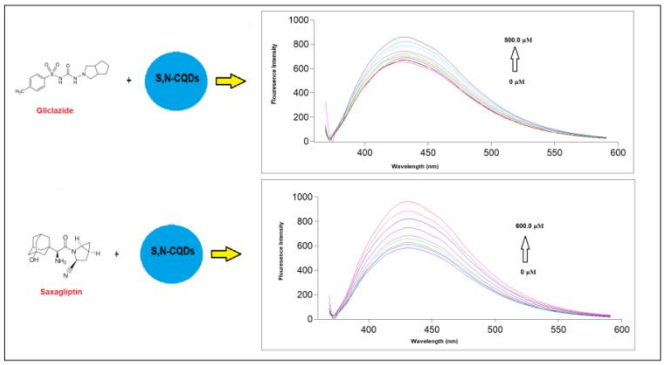
Abstract

In this study, highly fluorescent sulfur and nitrogen doped carbon quantum dots (S,N-CQDs) were used as fluorescent nanosensors for direct spectrofluorimetric estimation of each of gliclazide and saxagliptin without any pre-derivatization steps for the first time. S,N-CQDs were synthesized employing a simple hydrothermal technique using citric acid and thiosemicarbazide. The produced S,N-CQDs were characterized using different techniques including fluorescence emission spectroscopy, UV spectrophotometry, high resolution transmission electron microscopy, and FT-IR spectroscopy. Following excitation at 360 nm, S,N-CQDs exhibited a strong emission peak at 430 nm. The native fluorescence of S,N-CQDs was quantitatively enhanced by addition of increased concentrations of the studied drugs. The fluorescence enhancement of S,N-CQDs and the concentrations of the studied drugs revealed a wide linear relationship in the range of 30.0-500.0 µM and 75.0-600.0 µM with limits of detection of 5.0 µM and 10.15 µM for gliclazide and saxagliptin, respectively. The proposed method was efficiently utilized for determination of cited drugs in their commercial tablets with % recoveries ranging from 98.6 to 101.2% and low % RSD values (less than 2%). The mechanism of interaction between S,N-CQDs and the two drugs was studied. Validation of the proposed method was carried out in accordance with ICH guidelines.

Graphical abstract



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Spectrophotometric methods for simultaneous determination of fluconazole and tinidazole.

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Abstract:

Five rapid, accurate and reliable spectrophotometric methods have been developed for the quantitative estimation of combined antifungal formulation containing fluconazole (FLU) and tinidazole (TNZ). These methods including ratio derivative method (1DD), ratio difference, ratio subtraction, conventional dual wavelength method (DW) and isosbestic point method (ISP). The methods are capable to determine the drugs over the concentration range of 1.5-15.0 and 3.0-17.0 µg/ml for FLU and TNZ, respectively. The methods are used to analyze synthetic mixtures of the mentioned drugs and extended to the dosage forms. Validation of the methods was applied as suggested by the ICH demonstrating acceptable precision and accuracy.

Keywords: fluconazole; tinidazole; spectrophotometry; pharmaceutical dosage forms

Simultaneous Spectrofluorimetric Determination of Remdesivir and Simeprevir in Human Plasma

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Abstract:

As new infectious mutations of SARS-CoV-2 emerged throughout the world, innovative therapies to counter the virus-altered drug sensitivities were urgently needed. Recent research indicated that simeprevir acts synergistically with remdesivir, allowing for a multiple-fold decrease in its effective dose when used at physiologically acceptable concentrations. The goal of this work is to develop a sensitive synchronous spectrofluorimetric approach to simultaneously quantify the two drugs in biological fluids. Using this method, remdesivir and simeprevir could be measured spectrofluorimetric Ally at 283 and 341 nm, respectively, without interference from each other using Δλ of 90 nm. For each of remdesivir and simeprevir, the method exhibited a linearity range of 0.10-1.10 µg/mL, with lower detection limits of 0.01 and 0.02 µg/mL and quantification limits of 0.03 and 0.05 µg/mL, respectively. The high sensitivity of the developed method permitted the simultaneous determination of both drugs in spiked plasma samples with % recoveries ranging from 95.0-103.25 with acceptable standard deviation values of 1.92 and 3.04 for remdesivir and simeprevir, respectively. The validation of the approach was approved by the International Council of Harmonization (ICH) guidelines.

Probing the potential toxicity of trimetazidine by characterizing its interaction with human serum albumin

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Abstract

Since the small molecular drugs pharmacodynamics and pharmacokinetics could be affected by human serum albumin (HSA) transport, we used spectroscopic and molecular docking studies to investigate the interaction between HSA and the angina-prevention drug trimetazidine (TMZ). As shown by synchronous fluorescence spectroscopy, this interaction affects the microenvironment confirmation around tyrosine residues. The site-competitive experiments showed that TMZ had an affinity toward subdomain III A (site II) of HSA. The enthalpy and entropy changes (ΔH and ΔS), which were 37.75 and 0.197 K J mol-1, respectively, showed that the predominant intermolecular interactions stabilizing the TMZ-HSA combination are hydrophobic forces. According to FTIR research, the interaction between HSA and TMZ caused polypeptide carbonyl-hydrogen bonds to rearrange. Additionally, the HSA esterase enzyme activity was assessed, which revealed a decrease in activity with TMZ. Docking analysis confirmed the site-competitive experiments and thermodynamic results. Also, it showed that TMZ has strong affinity for binding to HSA and inserted into HSA subdomain III A (site II) with score of -12.65. This study demonstrated that TMZ interacted with HSA, and the structure and function of HSA were influenced by TMZ. This study could aid in understanding the pharmacokinetics of TMZ and provide basic data for safe use.

Keywords: Human serum albumin; Trimetazidine; Docking analysis; Fluorescence studies.

Graphical Abstract

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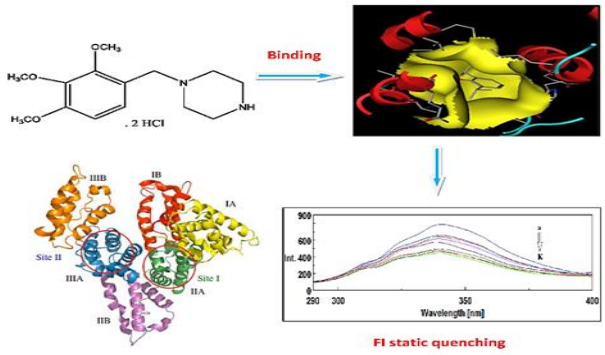

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Green fluorometric strategy for simultaneous determination of the antihypertensive drug telmisartan (A tentative therapeutic for COVID-19) with Nebivolol in human plasma

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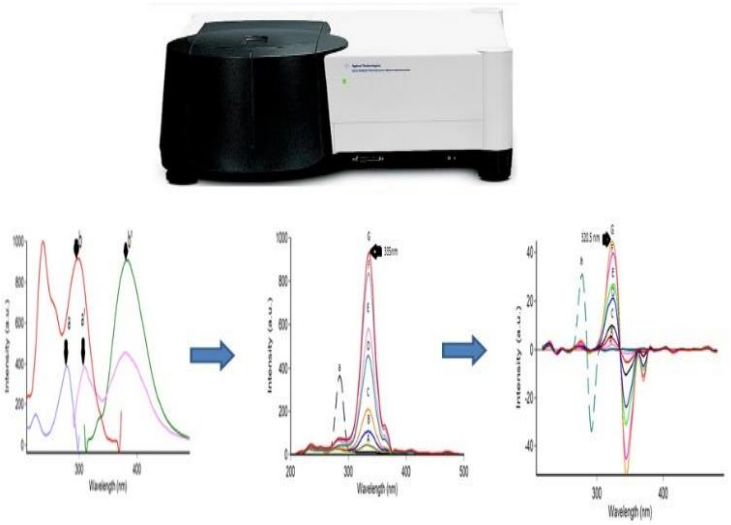
Abstract

Telmisartan (TEL) and Nebivolol (NEB) are frequently co-formulated in a single dosage form that is frequently prescribed for the treatment of hypertension, moreover, telmisartan is currently proposed to be used to treat COVID19-induced lung inflammation. Green rapid, simple, and sensitive synchronous spectrofluorimetric techniques for simultaneous estimation of TEL and NEB in their co-formulated pharmaceutical preparations and human plasma were developed and validated. Synchronous fluorescence intensity at 335 nm was used for TEL determination (Method I). For the mixture, the first derivative synchronous peak amplitudes (D^1) at 296.3 and 320.5 nm were used for simultaneous estimation of NEB and TEL, respectively (Method II). The calibration plots were rectilinear over the concentration ranges of 30–550 ng/mL, and 50–800 ng/mL for NEB and TEL, respectively. The high sensitivity of the developed methods allowed for their analysis in human plasma samples. NEB`s Quantum yield was estimated by applying the single-point method. The greenness of the proposed approaches was evaluated using the Eco-scale, National Environmental Method Index (NEMI), and Green Analytical Procedure Index (GAPI) methods.

Graphical abstract



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Two Versatile Pencil Graphite–Polymer Sensor Electrodes Coupled with Potentiometry and Potentiometric Titration Methods: Profiling Determinations of Vitamin V in Tablets and Urine Samples

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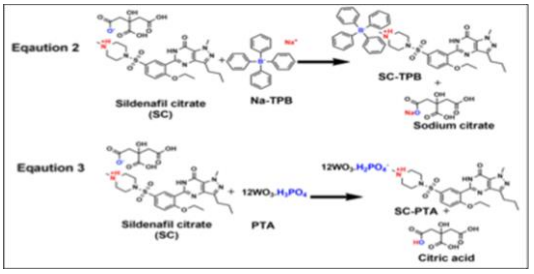
Abstract

Herein, we developed a new pencil graphite ion-selective electrode strategy for the broadly used erectile dysfunction medication, sildenafil citrate (SC, vitamin V), for its automated poten- tiometry and potentiometric titration profiling in marketed tablets and human urine samples. The method was based on ion-pair complexation between SC and sodium tetraphenylborate (Na-TPB) or phosphotungstic acid (PTA), embedded into a pencil-fabricated graphite sensor electrode coated with poly(vinyl chloride, PVC) matrix, which is pre-plasticized with two different pre-studied plasticizers. The modern fabricated electrodes have a proven fast near-Nernstian response for SC over the concen- trationrangeof1.0×10^{-6} to1.0×10^{-2} and1.0×10^{-5} to1.0×10^{-2} M,withLODsof6.5×10^{-7} and 5.5×10^{-6} over a pH 3–6 for (SC-TPB)- and (SC-PTA)-based membrane sensors, of O-nitrophenyl octyl ether (O-NPOE) and dioctyl phthalate (DOP), respectively. The selectivity coefficients for differ- ent interferents, including many inorganic cations, sugars, and/or nitrogenous compounds, were tested and confirmed. Applications of the proposed method were conducted on the determination of SC in its tablets and urine samples under the proper conditions. The percent recovery values were compared with those obtained by an official method and showed an RSD ≤ 0.3% (n = 5).

Graphical Abstract



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carbon quantum dots as a sensitive fluorescent probe for quantitation of pregabalin; application to real samples and content uniformity test

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Abstract

A novel optical nano-sensor for the detection of pregabalin (PG) in its pharmaceutical (Lyrica®) capsules and biological samples was reported. For the fabrication of highly fluorescent carbon quantum dots (CQDts), a simple green hydrothermal approach was described, and ascorbic acid (AA) was used as a carbon source. The obtained CQDts were confirmed by spectroscopic characterization such as transmission electron microscopy (TEM) and Fourier-transform infrared (FTIR) spectra. The synthesized CQDts were capped by alcohol to form yellow emitters, showing strong fluorescent emission at 524 nm, and excitation at 356 nm. The method is based on fluorescence quenching of CQDts in the presence of PG. The proposed analytical method was validated according to ICH guidelines. PG was successively assayed in the concentration range of 4.0 to 100 µg/ml). The detection and quantitation limits were 1.12 and 3.39 µg/ml, respectively. The proposed method could be used in both quality control and pharmacokinetic research for the studied drug

KEYWORDS: carbon quantum dots, fluorescence, hydrothermal synthesis, nano-sensor, pregabalin

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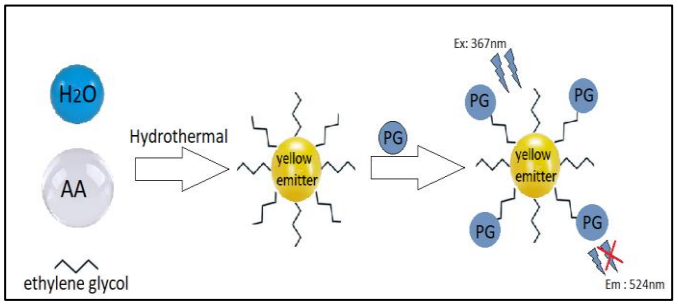

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Fluorimetric Micelle Complexation Approach for Direct Estimation of Anticancer Drug Avapritinib in Biological Fluid; Applications to Uniformity Test, Pharmacokinetic, and Greenness Assessments

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Abstract

Avapritinib (**AVA**), the first precision medication to be authorized by the US FDA in 2020, is used to treat patients with gastrointestinal stromal tumors (GISTs) that are unresectable or have metastasized as well as progressive systemic mastocytosis. Cancer is among the most common causes of death worldwide and the second most common cause of death generally, after cardiovascular diseases. Therefore, a quick, easy, sensitive, and straightforward fluorimetric approach was used to analyze AVP in pharmaceutical materials and blood plasma (pharmacokinetic). The suggested technique relies on 2% SDS (pH 4) micellar system augmentation of the tested drug's inherent fluorescence. The technique demonstrated excitation at 340 nm and a maximum in emission at 430 nm. The concentration ranges (10.0 - 400.0 ng mL^{-1}). The fluorescence quantum yielding of a certain fluorescence solution are frequently increased when a surfactant is introduced at a concentration over its critical micellar level. This knowledge has been exploited to enhance the effectiveness of spectrofluorimetric technique for estimation of AVA in human plasma (97.89 %) and uniformity test with greenness assessments. The conditions of enhanced fluorescence were optimized and fully validated using USFDA and ICH rules. The innovative strategy was expanded for AVA stability research in human plasma across various circumstances. The approach is an eco-friendlier solution compared to traditional testing methods that use hazardous chemicals.

Graphical abstract

Highly sensitive fluorimetric method for analysis of AVA in human plasma with high percentage of recovery.

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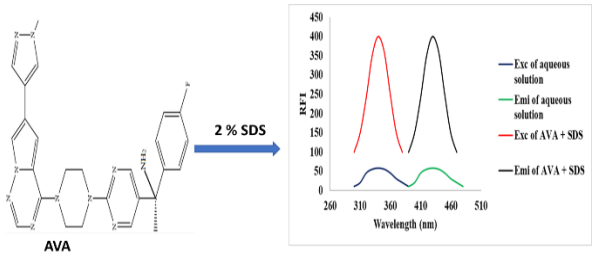

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Flow Injection Sensing Strategy for Determining Cationic Surfactants in Commodity and Water Samples

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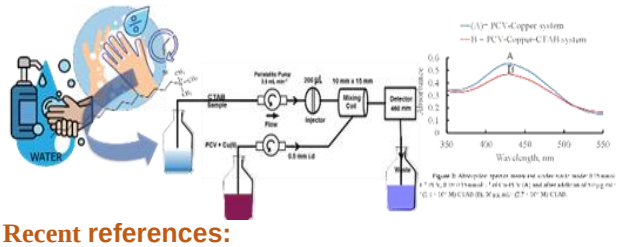
Abstract

The formation of stable binary water-soluble sub-micellar aggregates of cetyltrimethylammonium bromide-copper-pyrocatechol violet complex (CTAB-Cu-PCV) diminishes the stability and absorbance of the Cu-PCV complex. A new flow injection spectrophotometric sensing strategy used for the determination of CTAB in commodity personal care antiseptics and water samples has been established relying on the above-mentioned concept. Based on the reduction of the absorption of the Cu-PCV solution by the injection of CTAB solution at pH 6.0 and 430 nm, a linear absorbance decrease was observed over the CTAB concentration range of 2.0 to 100.0 µg mL^{-1} (r = 0.987). The analysis method showed limits of detection (3.3 σ) and quantification (10 σ) of 0.08 and 0.27 µg mL^{-1}, respectively. The precision (RSD) for five replicate determinations was 7.9 and 3.7% at 10 and 50 µg mL^{-1}, respectively. The developed method was applied successfully to the determination of CTAB in personal care products, namely skin lotion and vaginal wash, in addition to water samples. The corresponding RSD (n = 5) values were ≤ 8.2%.

Keywords: cetyltrimethylammonium bromide (CTAB); copper-pyrocatechol violet complex (Cu-PCV); flow-injection spectrophotometry; personal care antiseptic products; water sample

Graphical abstract



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Biography :

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“ON-OFF-ON” fluorescence switches based on new boron and nitrogen co-doped carbon dots: Facile hydrothermal synthesis, selective detection of Al3+ ion, and reversible sensor for F- ion

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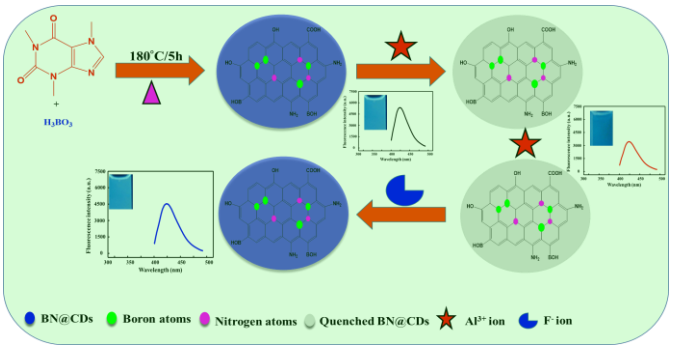
Abstract

Contamination of water with hazardous ions becomes a major environmental problem worldwide. Therefore, the fabrication of simple, cost-effective, and reliable sensors is essential for identifying of these ions. Herein, new caffeine and H3BO3-derived boron (B) and nitrogen

(N) co-doped carbon dots (BN@CDs) were synthesized. The as-prepared BN@CDs probe was used for the tandem fluorescence sensing of Al^{3+} and F^- based on “ON-OFF-ON” switches. The BN@CDs nanoswitch has high quantum yield of 44.8 % with λexc. and λem. of 360 nm and 440 nm, respectively. The probe exhibited good stability under different pH, ionic-strengths, and irradiation times. The fluorescence emission of BN@CDs was decreased as a result of increasing the concentration of Al^{+3} in the range of 0.03-90 µM with a detection limit (S/N=3) of 9.0 nM. Addition of F^- recovered the fluorescence of BN@CDs due to the coordination interaction between Al^{3+} and F^- forming stable $Al(OH)_3F^-$. Therefore, the ratio response (F/F°) was increased with increasing the concentration of F^- in the range of 0.18-80 µM with a detection limit (S/N=3) of 50.0 nM. The BN@CDs sensor exhibits some advantages over other reported methods in the term of simplicity, high quantum yield, and low detection limit. Importantly, the sensor was successfully applied to determine Al^{3+} and F^- in different environmental water samples with acceptable results.

Graphical abstract



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Biography

Mohamed M. El-Wekil is currently an Associate Professor at Pharmaceutical Analytical Chemistry Department, Faculty of Pharmacy, Assiut University, Assiut, Egypt. He gained his Master and Ph.D degree in Pharmaceutical Analytical Chemistry from Assiut University. He has a good expertise in the field of pharmaceutical analysis including: spectroscopy (spectrophotometry, spectrofluorimetry, FTIR spectroscopy), Nanotechnology and electro analysis. He has publications in different fields of Pharmaceutical Analytical chemistry.

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Facile application of fourier transform infrared spectroscopy for solid state analysis of milnacipran. Application to content uniformity

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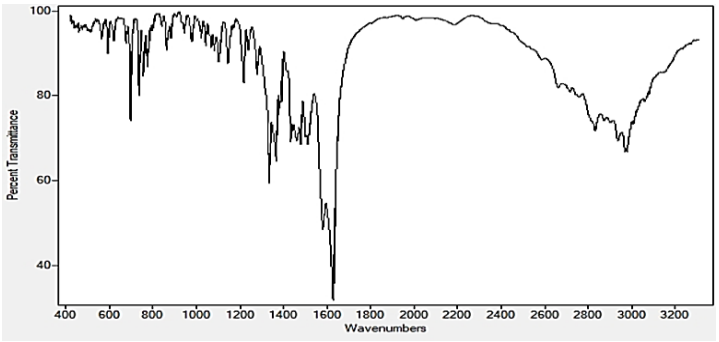
Abstract

In this study, facile, non-destructive, and economic IR spectroscopic method was validated for direct analysis of milnacipran. The suggested method depends on measuring the absorbance intensity of the carbonyl group of the cited drug at wavelength 1631 cm^{-1}. Validation of the proposed method was carried out by following the ICH rules. The method provides a linear range between milnacipran concentration and absorbance at 1 – 15 mg/g. The values of the estimated quantitation and detection limits were 0.96 and 0.32 respectively. The method was applied to milnacipran analysis of the dosage form successively and the percentage of recovery was 98.08 ± 1.76. Moreover, the proposed method was applied for checking content uniformity in Milnavella 12.5 mg tablets and the calculated acceptance value was lower than the maximum allowed value.

Graphical abstract

- **IR spectrum of milnacipran.**



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Biography

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A highly sensitive switch-on spectrofluorometric method for determination of ascorbic acid using a selective eco-friendly approach

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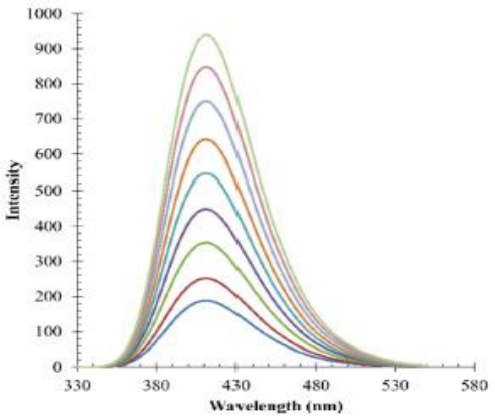
Abstract:

Ascorbic acid has recently been extensively used due to its role in the management of COVID-19 infections. The currently used spectrofluorometric methods for determination of ascorbic acid require using derivatizing agents or fluorescent probes and suffer from a number of limitations, including slow reaction rates, low yield, limited sensitivity, long reaction times and high temperatures. In this work, we present a highly sensitive spectrofluorometric method for determination of ascorbic acid by switching-on the fluorescence of salicylate in presence of iron (III) due to a reduction of the cation to iron (II). The addition of ascorbic acid resulted in a corresponding enhancement in the fluorescence intensity of iron (III)-salicylate complex at emission wavelength = 411 nm. The method was found linear in the range of 1–8 µg/mL with a correlation coefficient of 0.9997. The limits of detection and quantitation were 0.035 mg/mL and 0.106 mg/mL, respectively. The developed method was applied for the determination of ascorbic acid in the commercially available dosage form; Ruta C60_ tablets. The obtained results were compared with those obtained by a reported liquid chromatographic method at 95% confidence interval, no statistically significant differences were found between the developed and the reported methods. Yet, the developed spectrofluorometric method was found markedly greener than the reference method, based on the analytical Eco-scale and the green analytical procedure index. This work presents a simple, rapid, and sensitive method that can possibly be applied for determination of ascorbic acid in pharmaceuticals, biological fluids, and food samples.



Emission fluorescence spectra obtained after adding different ASC concentrations to 100 µM iron (III) salicylate.

Biography:

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• B.Sc. of Pharmaceutical Sciences, Faculty of Pharmacy- Tanta University (2001).

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Luminescence. 34 (3) (2019) 375–381.

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Biochemistry

Diallyl trisulfide modulated autophagy in isoproterenol induced acute myocardial infarction

Nahla E. El-Ashmawy, Naglaa F. Khedr, Mohamed N. Shaban, **Ghada M. Al-Ashmawy**
Clinical Phytoscience volume 8, Article number: 20 (2022)

Abstract:

Acute myocardial infarction (AMI) is the most serious manifestation of coronary artery disease. The initial ischemia in AMI causes biochemical and metabolic alterations in cardiomyocytes. Objectives: The present study aimed to investigate the biomolecular mechanisms underlying cardioprotective effects of diallyl trisulfide (DATS) as well as captopril (CAP) in isoproterenol (ISO) induced AMI focusing on autophagy & PI3K/Akt signaling. Methods: Seventy male Albino rats were divided into seven groups as follows: Normal control, ISO, ISO + LY294002 (PI3K inhibitor), DATS+ISO, CAP+ISO, DATS+LY294002 + ISO, and CAP+LY294002 + ISO. All treatments (40 mg/kg DATS, 50 mg/kg CAP & 0.3 mg/kg LY294002) were given daily for two weeks before ISO injection (85 mg/kg for 2 days). At the end of the experiment, serum and cardiac tissues were collected. Serum cardiac troponin I (cTnI), and creatine kinase MB (CK-MB) were measured. Cardiac glutathione peroxidase (GSH-px), malondialdehyde (MDA), hypoxia-inducible factor 1 alpha (HIF-1α), autophagy proteins (P62 & LC3IIB) and gene expression of PI3K, Akt, FOXO-1, and eNOS were assessed. Histopathological examination of heart tissue was performed. Results: DATS and CAP significantly ($p < 0.01$) decreased serum CK-MB and cTnI, cardiac levels of MDA, HIF-1α, p62 and LC3IIB along with an increase in GSH-px activity compared with ISO group. Moreover, DATS and CAP significantly up-regulated PI3K, Akt, and eNOS gene expression but down-regulated FOXO-1 expression compared to ISO group. However, LY294002 reversed DATS and CAP cardioprotective effects. Conclusion: DATS and CAP prior treatment proved cardioprotective effects via modulation of autophagy, PI3K/Akt signaling, eNOS and FOXO-1 downregulation in ISO induced AMI rat model.

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Biography:

Dr. Ghada Mohammad Al-Ashmawy is Associate Professor of Biochemistry and Molecular Biology, Faculty of Pharmacy, Tanta University, Egypt. She has published more than 40 research articles in reputable journals. She is a member of Egyptian Association for Cancer Research. Research Interest: She studied the pathophysiological pathways of diseases to address new targets for drug discovery and to identify new non-invasive biomarkers for diagnosis or prognosis. She investigated the molecular mechanisms of drugs and the use of adjuvant or complementary therapy to improve therapeutic outcome. In vitro studies included differentiation of stem cells into antigen presenting immune cells.

Marrubium alysson L. Ameliorated Methotrexate-Induced Testicular Damage in Mice through Regulation of Apoptosis and miRNA-29a Expression: LC-MS/MS Metabolic Profiling

Sameh S. Elhady , **Hend E. Abo Mansour** ,Eman T. Mehanna ,Sarah M. Mosaad, Salma A. Ibrahim. Rawan H. Hareeri, ,Jihan M. Badr , and Nermeen A. Eltahawy

Plants, Volume (11), Article number 17: 2309, 2022

Abstract:

Despite the efficient anti-cancer capabilities of methotrexate (MTX), it may induce myelosuppression, liver dysfunction and testicular toxicity. The purpose of this investigation was to determine whether Marrubium alysson L. (M. alysson L.) methanolic extract and its polyphenol fraction could protect mouse testicles from MTX-induced damage. We also investigated the protective effects of three selected pure flavonoid components of M. alysson L. extract. Mice were divided into seven groups (n = 8): (1) normal control, (2) MTX, (3) Methanolic extract + MTX, (4) Polyphenolic fraction + MTX, (5) Kaempferol + MTX, (6) Quercetin + MTX, and (7) Rutin + MTX. Pre-treatment of mice with the methanolic extract, the polyphenolic fraction of M. alysson L. and the selected pure compounds ameliorated the testicular histopathological damage and induced a significant increase in the serum testosterone level and testicular antioxidant enzymes along with a remarkable decline in the malondialdehyde (MDA) level versus MTX alone. Significant down-regulation of nuclear factor kappa B (NF-κB), tumor necrosis factor-alpha (TNF-α), p53 and miRNA-29a testicular expression was also observed in all the protected groups. Notably, the polyphenolic fraction of M. alysson L. displayed a more pronounced decline in the testicular levels of interleukin-1β (IL-1β), interleukin-6 (IL-6) and MDA, with higher testosterone levels relative to the methanolic extract. Further improvements in the Johnsen score, histopathological results and all biochemical assays were achieved by pre-treatment with the three selected pure compounds kaempferol, quercetin and rutin. In conclusion, M. alysson L. could protect against MTX-induced testicular injury by its antioxidant, anti-inflammatory, antiapoptotic activities and through the regulation of the miRNA-29a testicular expression. The present study also included chemical profiling of M. alysson L. extract, which was accomplished by LC-ESI-TOF-MS/MS analysis. Forty compounds were provisionally assigned, comprising twenty compounds discovered in the positive mode and seventeen detected in the negative mode.

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Biography:

Lecturer of Biochemistry, PhD in Biochemistry- Suez Canal university (2020), M. Sc. in Biochemistry- Tanta university (2017), B.Sc. of Pharmaceutical Sciences, Faculty of Pharmacy-Tanta University (2012), Email: hend_elsaid@phrm.menofia.edu.eg

Chronotherapeutic Neuroprotective Effect of Verapamil against Lipopolysaccharide-Induced Neuroinflammation in Mice through Modulation of Calcium-Dependent Genes

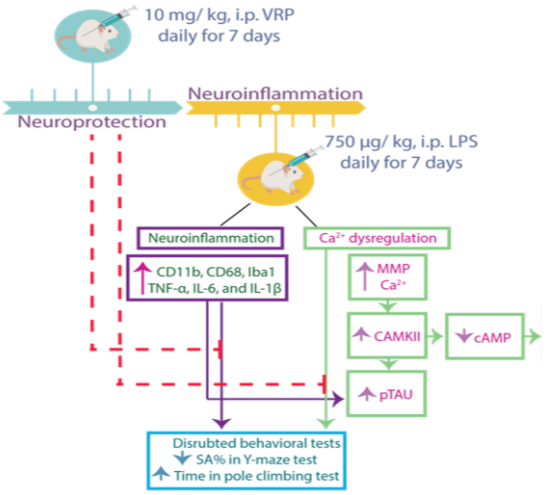
Esraa M. Mosalam, Aya Ibrahim Elberri, **Amany Said Sallam**, Heba Rady Salem, Ebtehal M. Metwally, Mahmoud S. Abdallah, Moataz A. Shaldam**, Hend E. Abo Mansour**

Abstract

Neuroinflammation is a major mechanism in neurodegenerative diseases such as Alzheimer's disease (AD), which is a major healthcare problem. Notwithstanding of ample researches figured out possible molecular mechanisms underlying the pathophysiology of AD, there is no definitive therapeutics that aid in neuroprotection. Therefore, searching for new agents and potential targets is a critical demand. We aimed to investigate the neuroprotective effect of verapamil (VRP) against lipopolysaccharide (LPS)-induced neuroinflammation in mice and whether the time of VRP administration could affect its efficacy. Methods: Forty male albino mice were used and were divided into normal control, LPS only, morning VRP, and evening VRP. Y-maze and pole climbing test were performed as behavioral tests. Hematoxylin and eosin together with Bielschowsky silver staining were done to visualize neuroinflammation and phosphorylated tau protein (pTAU); respectively. Additionally, the state of mitochondria, the levels of microglia-activation markers, inflammatory cytokines, intracellular Ca2+, pTAU, and Ca2+-dependent genes involving Ca2+/ calmodulin dependent kinase II (CAMKII) isoforms, protein kinase A (PKA), cAMP response element-binding protein (CREB), and brain-derived neurotrophic factor (BDNF), with the level of VRP in the brain tissue were measured. Results: LPS successfully induced neuroinflammation and hyperphosphorylation of tau protein, which was indicated by elevated levels of microglia markers, inflammatory cytokines, and intracellular Ca2+ with compromised mitochondria and downregulated CAMKII isoforms, PKA, CREB and BDNF. Pretreatment with VRP showed significant enhancement in the architecture of the brain and in the behavioral tests as indicated by the measured parameters. Moreover, morning VRP exhibited better neuroprotective profile compared to the evening therapy. Conclusions: VRP highlighted a multilevel of neuroprotection through anti-inflammatory activity, Ca2+ blockage, and regulation of Ca2+-dependent genes. Furthermore, chronotherapy of VRP administration should be consider to achieve best therapeutic efficacy.

Graphical Abstract

Graphical Abstract



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Antiglycating and Antiaggregation potentials of Artificial Sweeteners

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Abstract

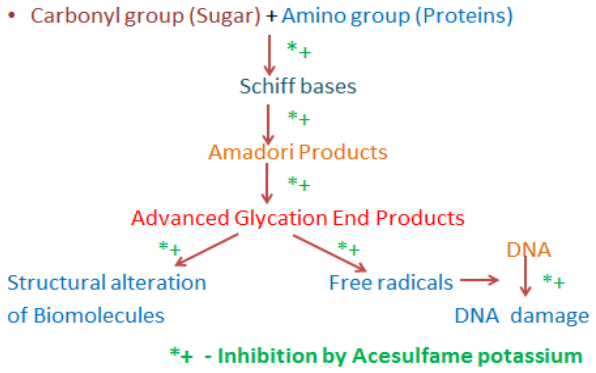
Diabetes is a metabolic disorder which is manifested in the form of glucotoxicity and hyperglycemia. Accumulation of sugars leads to the generation of deleterious products. Amadori and Advanced Glycation End products (AGEs) are formed as a result of the interaction between carbonyl groups of reducing sugars and amino groups of proteins and other macromolecules during Glycation. Artificial sweeteners have replaced the natural sugars in the food and beverage industry because of many reasons such as hyperglycemia and cost. Acesulfame-K, Aspartame, Saccharin, and Sucralose are the most commonly used sweeteners. The objective of this study was to investigate the influence of artificial sweeteners on the formation of AGEs and protein oxidation in an *in vitro* model of glucose-mediated protein glycation. In the present study, all these sweeteners were used to assess their glycating properties by established methods like fructosamine assay, determination of carbonyl content, protein aggregation and measurement of fluorescence. The results indicated that most of the artificial sweeteners used in the study did not affect the process of glycation. However it was found that Acesulfame potassium has antiglycating potential as it caused decreased formation of Amadori products and AGEs in a duration-dependent manner. . It was also observed that Acesulfame potassium prevented the glycation induced aggregation of BSA. This study is significant in understanding the probable role of artificial sweeteners in the process of glycation and the subsequent effect on macromolecular alteration.

Keywords: Advanced Glycation end products (AGEs), Amadori products, Artificial sweeteners, Browning, Carbonyl content, Protein aggregation

Biography:

Dr. Ahmad Ali is currently working in the Department of Life Sciences, University of Mumbai, Mumbai as Assistant Professor. Earlier he worked in the National Institute of Pharmaceutical Education and Research (NIPER). He studied at Jamia Hamdard and University of Mumbai obtaining his M. Sc. and Ph. D. degree in Biochemistry. He has over 10 years of teaching and research experience. He is recognized guide for Ph.D. in Life Sciences and heading the Molecular Biochemistry laboratory in the Department. His areas of research are Protein and DNA Biochemistry with special contributions on Glycation of biomolecules, DNA damage, and antiglycating properties of natural products. He has also made significant contributions in the area of artificial sweeteners and their role in the process of glycation.

Graphical Abstract



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Novel Pharmacogenomics postgraduate program; A degree for the future

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Abstract:

Towards the end of the last century the expression of 'personalized medicine' came to life. This simply means the right drug for the right patient with the right dose. We all now understand that the difference between any individuals regarding their DNA sequence is only about 0.1%. In spite of the fact that this is really a tiny figure, it is enough to lead to important effects on disease susceptibility and progression. Identification of the proper drugs for specific patient phenotypes will heighten the drug efficacy, lessen expected adverse outcomes, increase cost effectiveness and elevate public confidence in marketed pharmaceuticals. Although the healthcare community in Egypt and Lebanon has identified the need for academic educational programs on pharmacogenomics and personalized medicine, there has been no appreciable effort done yet in either country to fill this gap. Even the awareness of such programs is low. There exists no higher educational degree for pharmacogenomics in Egypt or Lebanon. Thus, there is a pressing need to implement pharmacogenomics educational programs in core training of pharmacists in the region. Moreover, there are very few programs in Egypt or Lebanon that make use of online education using IT and e-laboratories. This kind of smart learning program facilitates the education process and makes it suitable for the greatest numbers of target groups outside the Egyptian borders. Herein, we have designed a novel diploma/master program in pharmacogenomics making use of generous funding from Erasmus plus. The planned project is a two-years postgraduate academic program. The first year includes a diploma with 9 courses (60 ECTS;equivalent to 24 Egyptian credits). The second year is optional and leads to a master degree comprised of 60 ECTS (equivalent to 27 Egyptian credits). Online as well as in-class courses will be offered.

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Crosstalk between microRNA-100 and metastasis-associated lung adenocarcinoma transcript 1 in hepatitis B virus infection

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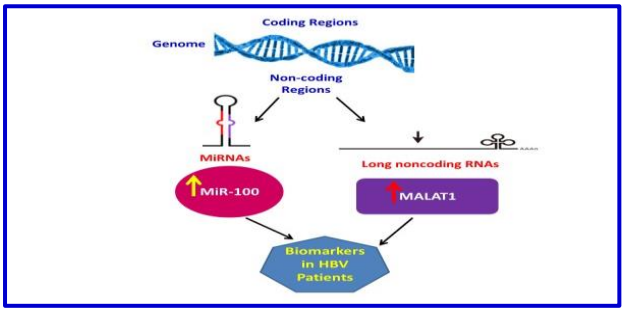
Running title: Role of miR-100 and MALAT1 in HBV

Abstract

Non-coding RNAs (ncRNAs) have a crucial role in Hepatitis B Virus (HBV) diagnosis and therapeutics. Among the major classes of non-coding RNA is the well-known microRNAs (miRNAs/miRs) and the most recently acknowledged long ncRNAs (lncRNAs). This study focused on a miR-100 Single Nucleotide Polymorphism (SNP) (rs1834306 T/C) and its contribution to an individual's susceptibility and prognosis of HBV infection. The effect of SNP on miR-100 expression will be also evaluated. In addition, the expression level of Metastasis-associated lung adenocarcinoma transcript 1 (MALAT1) was measured. Two hundred subjects divided into 100 HBV infected patients and 100 age-and-sex-matched healthy individuals served as a control group. SNP detection was performed using sequence-specific primer polymorphism-polymerase chain reaction (SSP-PCR) method and the expression level of both miR-100 and MALAT1 was measured through quantitative real-time PCR (qRT-PCR). Concerning miR-100 genotyping result, TC genotype represents the most frequent genotype in all subjects. A significant up-regulation of both miR-100 ($p<0.01$) and MALAT1 ($p<0.05$) expression was observed in the patients' group compared to controls. A positive correlation was found between viral load and elevation in miR-100 and MALAT1 expressions ($r= 0.508$; $P<0.01$ and $r=0.282$; $P<0.05$ respectively) with viral load. Accordingly, they might be considered as a potential molecular marker to appraise prognosis of patients with HBV. Best of our knowledge**,** this is the first observational prospective case-control study to scrutinize all the possible correlations between miR-100 and MALAT1 and to quantify their expression levels in addition to assess the genetic variation of miR-100 and its effect on the susceptibility to hepatitis B infection in the Egyptian population. Near future, larger studies with a large sample size are recommended to confirm our findings.

Graphical abstract



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Biography:

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REDISCOVERED NATURAL SOURCE FOR FOOD, PHARMACEUTICAL AND COSMETICS INDUSTRIES: OLIVE TREE

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Abstract:

The olive, an ancient and immortal tree, has a special place during the long human history. All parts of the plant, i.e., wood, fruit, olive oil, olive stone, olive leaf and olive flower have been used for ethnobotanical purposes. While the wood is an excellent firewood for heating due to its high calorific value and slow-burning properties, it is also used for home furniture, kitchen staff, and souvenirs. Besides the wood, olive pomace or olive cake, which contains carbohydrates, protein, fat, lignin, pectin, cellulose, hemicellulose, reducing sugars, phenols, and a number of inorganic compounds, is also an important organic waste for cheap and clean energy. Olive fruits with their unique nutritional components are mainly used as green and black table olives, especially in Mediterranean countries. Olive oil, obtained by squeezing the olive fruits including olive kernels, has been used for food, cosmetic and medicinal purposes since prehistoric times. Having distinguished phytochemical constituents, olive oil is a very important natural raw material for the pharmaceutical and cosmetics industries, as well. In addition to its unique fatty oil composition, olive biophenols are of great importance for many ailments. For instance, oleuropein, hydroxytyrosol, tyrosol, caffeic acid, and ligstroside, the most abundant polyphenol and phytochemicals in olive leaves, have been demonstrated to have anti-inflammatory and anti-thrombotic properties, which means that it may be effective in reducing the risk of strokes, heart attacks, and other cardiovascular diseases. Olive oil, with its anti-aging antioxidants and moisturizing squalene, is superb for hair, skin, and nails and has been used for centuries as a cosmetic and natural skin care product. Our research team has found that early-harvest cold-pressed olive oil is a good source of omega-7 fatty acids like paullinic acid and palmitoleic acid. Olive oil is also an odorless, smokeless renewable fuel that is a popular alternative to lamp oil since ancient times. Olive leaf with high oleuropein content is a unique traditional medicine for many ailments i.e., diabetes, cardiovascular disease, cancer, and a number of health problems, particularly in Mediterranean region. In the COVID-19 pandemic period, olive leaf was mentioned for antiviral effects, as well. Olive kernels are of traditional medicines especially for gastrointestinal disorders, gastritis, and reflux in southeastern Anatolia in Türkiye. Recent scientific studies have shown that olive kernels have distinguished phytochemicals. Our team found that the olive kernel inside the seeds contains a unique fatty acid, nervonic acid. Also, a novel herbal coffee, olive kernel coffee, without caffeine has been produced from olive stones, as well. Our recent study showed that olive flowers rich in phenolic substances could be a natural source of natural products for relevant industries. Thus, the olive tree and all its parts are waiting for discovery as natural sources for the food, pharmaceutical, and cosmetics industries.

Keywords: Olive tree, olive fruit, olive oil, olive leaf, olive flower, health, food, cosmetics

MULTI-TARGET MECHANISMS OF NUTRACEUTICALS AND PHYTOCHEMICALS AGAINST ALZHEIMER'S DISEASE

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Abstract:

Alzheimer's disease (AD) is a devastating neurodegenerative disorder that affects millions of people worldwide. The best-known pathophysiological features of AD are the aggregation of neurotoxic forms of amyloid-β proteins in senile plaques and the accumulation of hyperphosphorylated tau proteins in neurofibrillary tangles, causing to cognitive impairment, memory loss, dementia, and eventually death. Because FDA-approved anti-AD drugs have only a symptomatic effect, the search continues. for alternative and more effective therapeutic targets for the treatment of the disease. Therefore, there are new studies suggesting that nutraceuticals and phytochemicals with medicinal properties may play significant roles in the prevention and treatment of this debilitating disease. Natural compounds found in plants, known as phytotherapeutics may have neuroprotective effects and could potentially be used in the treatment of AD. Many phytochemicals have antioxidant, anti-inflammatory, and neuroprotective properties, which are particularly relevant in the context of AD. Oxidative stress and chronic inflammation are thought to contribute to the development and progression of AD. One of the reasons for this is their ability to target multiple signaling pathways involved in the disease, known as multi-target mechanisms. By targeting multiple pathways, nutraceuticals and phytochemicals have the potential to be more effective in treating AD than single-target drugs. For example, some phytochemicals, such as curcumin, resveratrol, epigallocatechin-3-gallate (EGCG), and quercetin have been shown to reduce inflammation, protect against oxidative stress, and inhibit the formation of beta-amyloid plaques, which are a hallmark of AD. In animal models of AD, these compounds have been shown to have neuroprotective effects by improving cognitive function and reducing inflammation and oxidative stress in animal models of AD. Despite the potential benefits of phytotherapeutics in the treatment of AD, there are also several challenges that need to be addressed in order to develop effective drugs. One of the major challenges is the lack of standardization in the preparation of plant extracts, which can lead to variability in the concentration and bioactivity of the active compounds. One challenge is that many phytochemicals have poor bioavailability, meaning that they are not easily absorbed by the body. Another challenge is the need for more rigorous clinical trials to evaluate the safety and efficacy of phytotherapeutics in the treatment of AD. Researchers are exploring various strategies to overcome this limitation, including the use of nanoparticles and other delivery systems to enhance the absorption and distribution of phytochemicals in the blood-brain barrier. These trials need to be conducted using standardized protocols and endpoints to provide reliable data on the effectiveness of these compounds. Accordingly, mechanistic roles and molecular targets of nutraceuticals and phytochemicals in the prevention and treatment of AD are highlighted in this review.

Keywords: Alzheimer's disease, phytochemicals, neuroprotection, natural products, phytotherapeutics

The Role of WNT/β-catenin Signaling Pathway and Glutamine Metabolism in the Pathogenesis of CCl4-Induced Liver Fibrosis: Repositioning of Niclosamide and Concerns about Lithium

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Abstract

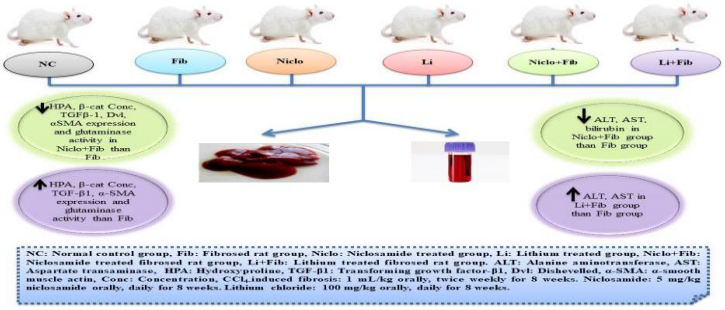
Background: Liver fibrosis is a serious health problem which may lead to advanced liver cirrhosis and hepatocellular carcinoma. ***Objective*:** The present study aimed to investigate the role of Wnt/β-catenin signaling pathway and glutamine aminohydrolase enzyme (L-glutaminase) in the pathogenesis of liver fibrosis and the potential benefits of niclosamide in treating liver fibrosis. ***Methods*:** Ninety male Albino rats were divided into 6 equal groups (n=15) as follows: a normal control group (NC), CCl_4-only treated group (Fib.) which received 1mg/kg CCl_4 two times weekly, niclosamide-treated group (Niclo.) which received 5 mg/kg of niclosamide one time daily, lithium chloride-treated group (LiCl) which received 100 mg/kg of LiCl one time daily, niclosamide-and-CCl_4-treated group (Niclo.+Fib.) which received same doses of niclosamide and CCl_4 given to other groups, and finally lithium chloride-and-CCl_4-treated rat group (LiCl+ Fib.) which received same doses of LiCl and CCl_4 given to other groups. All treatments were administered orally for 8 weeks. Liver tissue was assessed for L-hydroxyproline, beta-catenin (β-catenin), L-glutaminase activity, as well as the gene expression of transforming growth factor beta-1 (TGF-β1) and Dishevelled-2 (Dvl2). Histopathological and immunohistochemical analyses of alpha smooth muscle actin α-SMA were performed. Serum alanine transaminase (ALT), aspartate transaminase (AST), and total bilirubin were measured. ***Results*:** The group of niclosamide-and-CCl_4-treated rats showed a significant decrease in total bilirubin, ALT and AST, β-catenin, L-hydroxyproline, L-glutaminase activity, and gene expression of TGF-β1 and Dvl2. Moreover, the liver tissue in this group of rats showed mild α-SMA reactivity compared with the rats treated with CCl_4 only (fibrosis group). On the other hand, lithium chloride-and-CCl_4-treated rats showed a significant increase in liver indices, TGF-β1 expression, β-catenin, L-hydroxyproline, and L-glutaminase activity with severe α-SMA reactivity and apoptosis in the liver tissue. ***Conclusions*:** Niclosamide protected rats against liver fibrosis by inhibiting the Wnt/β-catenin pathway and glutaminolysis.

Keywords: Beta-catenin, Dishevelled, Glutaminase, Lithium, Liver fibrosis, Niclosamide

Biography

Contractual teaching assistant at Biochemistry Department Menufyia University September 2018 - 2022. Clinical Pharmacist at «Brain and. Neurosurgery Hospital» July 2011 – till now. PHD student in Biochemistry Department, Faculty of Pharmacy/Suez Canal University from September 2021. Master degree in Biochemistry department, Faculty of Pharmacy/Tanta University, Grade Excellent with honor

Graphical abstract



The effect of niclosamide, as a WNT inhibitor, and lithium chloride, as a WNT activator on CCl_4-induced liver fibrosis in rats

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Sofosbuvir induced hepatocellular carcinoma via activation of IGF1R: An integrated bioinformatics approach

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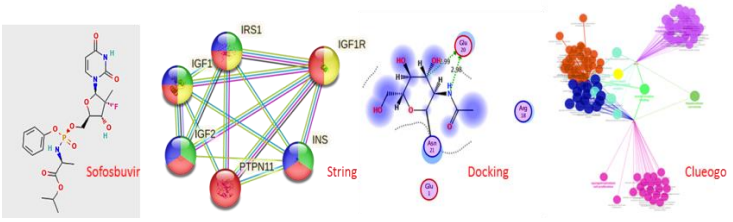
Abstract

Sofosbuvir is a medication used to treat hepatitis C virus (HCV) infection by inhibiting the RNA-dependent RNA polymerase enzyme of the virus. However, studies have found that Sofosbuvir may be associated with an increased risk of developing or recurring hepatocellular carcinoma (HCC), especially in patients with chronic HCV and a history of HCC. To explore the potential mechanisms underlying this association, a protein-protein interaction network was constructed using the STRING Cytoscape plugin, which identified five genes (IGF1R, INS, IGF1, IGF2, and IRS1) involved in this process. The results revealed that these genes were significantly enriched in the chemical carcinogenesis pathway, a known mechanism for developing HCC. The molecular docking and validation stimulations were performed using PyRx and MOE programs to investigate the molecular interaction between Sofosbuvir and IGF1R. The results showed that Sofosbuvir had a high binding affinity with IGF1R, implying the involvement of Sofosbuvir in the development of HCC in patients. Eventually, the ADMET profile of Sofosbuvir was predicted employing SwissADME, admetSAR 2.0 and MolTox web servers to investigate its drug-likeness and pharmacokinetics properties. The findings divulged that sofosbuvir was satisfied with the Pfizer rule and was positive for hepatotoxicity. Overall, this study provides important insights into the potential molecular mechanisms underlying the association between Sofosbuvir and HCC, which may help guide the development of new treatments or strategies to reduce the risk of HCC in patients receiving Sofosbuvir treatment.



Biography

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Clinical Pharmacy & Pharmacology

SHORT AND LONG TERM CARDIOTOXICITY OF SOFOSBUVIR AND DACLATASVIR ASSOCIATED WITH LIPID PROFILE ABNORMALITIES

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Abstract:

Background: Direct-acting antivirals (DAA) are relatively a new group of drugs. Different studies reported disturbances in lipid metabolism among HCV patients treated with DAA combinations

Objective: This study tries to evaluate the short and long term effects of DDA on lipid profile, cardiac enzymes and oxidative stress, as well as, to determine if these effects are disease-related or drug-dependent.

Methods: Male Wistar rats were treated with sofosbuvir with or without daclatasvir for four consecutive weeks. Five samples were collected at day 0 (baseline point), another ten samples were obtained after four weeks (end of treatment point) and finally, after six months of treatment, the last ten animals were assigned for follow up point. AST, ALT, lipid profile, serum creatinine kinases and troponin were assessed colorimetrically. Moreover, liver tissue content of malondialdehyde was assessed.

Results: Results revealed that, at the end of drug therapy period, sofosbuvir whether alone or combined with daclatasvir caused significant increase in total cholesterol, LDL and triglyceride compared to baseline data. These effects were persistent for 20 weeks after the end of treatments. This increase in lipid profile was also correlated with a significant deterioration of cardiac markers such as troponin and creatinine kinase–MB and increased oxidative stress.

Conclusion: Sofosbuvir and/or daclatasvir elevate lipid profile and cardiac enzymes. These changes are due to the effects of direct acting antiviral agents and independent of hepatitis C virus infection. Consequently, Lipid profile and cardiovascular markers should be monitored during and after drug cessation.

Keywords: Sofosbuvir –daclatasvir – lipid profile – troponin – CK-MB – MDA

Evaluation of the neuroprotective effects imposed by Edible Bird Nest using a drug carrier in MPTP Induced Parkinson's Disease Zebrafish Model

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Abstract:

Parkinson's disease (PD) is the world's second most common neurodegenerative disorder, affecting people aged 55 to 70 years. PD has both motor and non-motor symptoms; in general, clinical trials focus on the motor symptoms, while awareness of non-motor symptoms is minimal. Patients with PD have long-term physical, social, and mental problems because of severe symptoms like slow movement, stiff muscles, tremors, depression, and hallucinations, which make their lives much less enjoyable. Until now, there is no effective treatment for this disorder. So, there is an urgent need for a lot of scientific research to figure out how the disease works and find possible therapeutic targets for preventing and treating the disorder effectively. MPTP(1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine) zebrafish has emerged as a very promising animal model for PD due to its fecundity, transparency and ease for gene manipulation and maintenance. The aim of this study is to investigate the neuroprotective properties of Edible Bird Nest (EBN) and MAO-B inhibitors using drug carrier technique. The targeted drug delivery is a prominent and efficient technique among all others Parkinson's disease treatment. In which, Deprenyel (5 mg/kg once daily intraperitoneally for 8 consecutive weeks) and EBN (intra peritoneal injection in 60 and 120 mg/kg twice daily for 8 consecutive weeks) molecules will be loaded. The efficiency of the drug nanocarrier bioconjugate will be analyzed with the help of zebra fish model. Nine groups of adult Danio rerio zebra fish will be used in this study. Each group consists of 10 (male and female) fish. Treated groups will be intra peritoneally injected with two doses of 50 µg of (10 µg/µl) MPTP with 24hrs interval between the doses. After 1 hour, the validation of the Parkinsonian disease will be completed using gene expression analysis of Lrrk7, Park2, Park7 and SNCGB genes which are the target genes involved in the pathogenesis of Parkinson disease. In addition, the behaviour testing will be evaluated using Danio vision for 1 hour in each group recording parameters such as speed of swimming, number of freezes bouts, freezes duration, number of crosses between upper and lower sections and distance travelled. Co-administration of EBN will decrease the amount/duration of available anti-PD drugs with better brain drug delivery leading to lowering their side effects.

Hydrogen sulfide alleviates acrylamide-induced testicular toxicity in male rats.

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Abstract:

Objective: Testicular tissues and sperms are typically vulnerable to oxidative stress and inflammation. Despite functioning as a signaling molecule in different physiological and pathological processes, hydrogen sulfide (H_2S) role in the reproductive system is not fully recognized. This study aimed to assess whether H_2S could counteract the testicular damage that acrylamide (AC) causes in male rats.

Main methods: Forty male rats were equally divided randomly into four groups: normal control, AC, H_2S, and AC + H_2S who received normal saline, 40 mg/Kg of AC, 200 µg/Kg of sodium hydrosulfide NaHS (H_2S donor), and 40 mg/Kg of AC + 200 µg/Kg of NaHS by intraperitoneal injection for 14 consecutive days, respectively. Body and testes weights, sperm count and motility, lactate dehydrogenase isoenzyme-x (LDH-X), serum testosterone level, oxidative parameters, the expression level of inducible nitric oxide synthase (iNOS), inflammatory cytokines, and histopathological alterations were evaluated.

Key findings: The reduction in relative testicular weights, sperm count, and motility served as evidence of the harmful effects of AC. However, these values were reversed when H_2S and AC were combined. Additionally, AC significantly decreased serum testosterone level, testicular LDH-X activity, superoxide dismutase, catalase, and reduced glutathione. While malondialdehyde, expression levels of iNOS protein and inflammatory cytokines (TNF-α, IL-1β, and IL-6) levels were elevated. Interestingly, the co-administration of H_2S with AC reversed these values, demonstrating an opposing effect in the previous parameters.

Significance: H_2S exhibited a protective effect in the rat model of testicular toxicity induced by AC, which may be associated with the suppression of iNOS expression, proinflammatory cytokines, and the inhibition of oxidative stress injury.

HEPATORENAL PROTECTIVE EFFECT OF CURCUMIN IN NORMAL AND INFECTED RATS WITH *STAPHYLOCOCUSS AUREUS* TREATED WITH AZITHROMYCIN

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ABSTRACT

The aim of this study was to determine the adverse effects of therapeutic dose of azithromycin 45 mg /kg body weight for 5 days in normal, and infected rats with *staphylococcus aureus* on liver and kidney functions . Forty five male Wister albino rats were randomly divided into main five groups including Group(1): control(normal saline only 0.2ml) .Group (2):rats treated with azithromycin orally(45 mg/kg b.wt) for 5 successive days. Group (3): rats were infected with *Staphylococcus aureus*. Group (4): rats were infected with *Staphylococcus aureus* and treated with azithromycin (45 mg/kg b.wt) daily for 5 successive days. Group (5): rats were infected with *Staphylococcus aureus* and treated with azithromycin orally (45 mg/kg b.wt) plus curcumin (20mg/kg b.wt) daily for 5 successive days. Treatment with azithromycin showed a significant ($P<0.05$) decrease of albumin level while the levels of serum transaminase (ALT and AST), alkaline phosphate (ALP) ,total bilirubin , direct bilirubin ,urea and creatinine were significantly increased .Otherwise rats administered azithromycin and curcumin showed a significant increase in albumin level and a significant decrease of serum transaminase (ALT and AST), alkaline phosphatase (ALP) ,total bilirubin , direct bilirubin ,urea and creatinine when compared with rats treated with azithromycin . Histopathological examinations of liver and kidney tissues confirmed the biochemical results. It is concluded that The administrations of therapeutic dose of azithromycin 45 mg /kg b.wt induced marked liver and renal damage . Supplementation of curcumin showed improvement in liver and kidney function .

KEYWORDS: azithermycin –curcumin-biochemical-histopathological

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Biography:

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Pramipexole and Lactoferrin ameliorate Cyclophosphamide-Induced haemorrhagic cystitis via targeting TLR-4/NF-κB, and NLRP3/caspase-1/IL-1β signalling pathways and modulating the Nrf2/HO-1 pathway

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Abstract

Background: The use of cyclophosphamide (CP) as a chemotherapeutic agent is limited by its major complication haemorrhagic cystitis (HC). Finding preventive, safe, and efficient treatments for such problems is extensively ongoing.

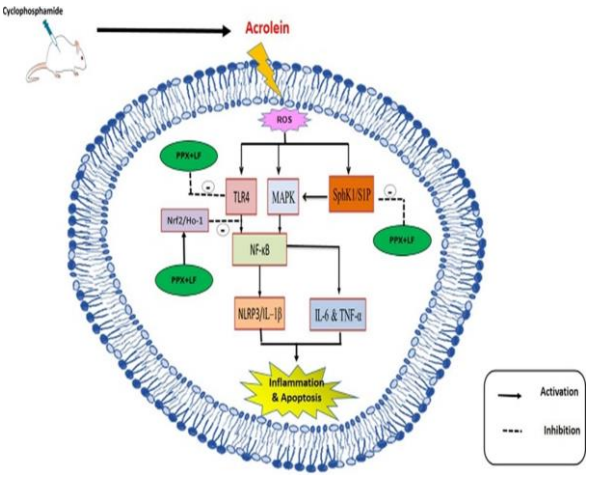
Objective*:* This research aims to assess the uroprotective effect of pramipexole (PPX) and/or lactoferrin (LF) against CP-induced HC, in addition to shedding light on their possible molecular targets.

Methods: Adult male Sprague-Dawley rats were orally administered PPX (3 mg/kg) and/or LF (300 mg/kg) for seven consecutive days, followed by a single intraperitoneal injection of CP (150 mg/kg).

Results*:* Pretreatment of CP-intoxicated rats with either PPX or LF mitigated oxidative urinary bladder damage via upregulation of the Nrf2/HO-1 signalling pathway, resulting in a significant reduction in bladder MDA and 8-OHdG levels with concomitant elevations in SOD activity and GSH content. Simultaneously, both drugs markedly halted inflammation in bladder tissue through inhibition of the TLR4/NF-κB signalling pathway, followed by a significant decrease in inflammatory cytokine levels (TNF-α and IL-6). Interestingly, the PPX/LF protocol inhibited the NLRP3/caspase1/ IL-1β axis. PPX/LF also significantly reduced BAX and caspase-3, in addition to increasing Bcl-2 levels in bladder tissue of CP-treated animals. These biochemical findings were supported by the improvement in the histological alterations induced by CP in the urinary bladder.

Conclusions: The current study verified the protective effect of PPX and LF against CP-induced HC by halting oxidative stress, inflammation, and apoptosis. The molecular mechanism underlying this protective effect may involve targeting the crosstalk among NF-κB, TLR-4/NF-κB, and NLRP3/caspase-1/IL-1β signalling pathways and modulating the Nrf2/HO-1 signalling pathway.

Graphical Abstract



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Canagliflozin ameliorates cognitive impairment induced by streptozotocin in mice

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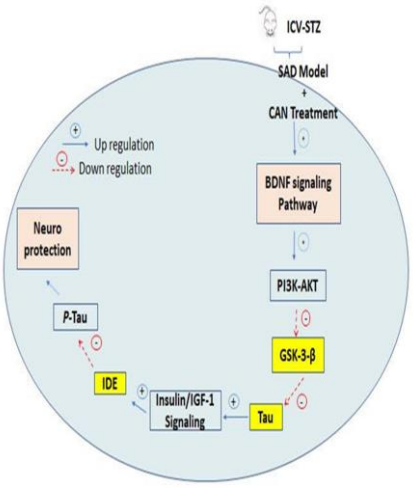
Abstract

Alzheimer's disease (AD) is a neurodegenerative disorder characterized by cognitive dysfunction, loss of memory, and impairments of attention. The hallmarks of AD pathophysiology are accumulation of amyloid-beta plaques and Tau, both change synaptic plasticity, leading to synapse loss, neural network dysfunction, and eventually neuron loss. The current work aimed to evaluate the neuroprotective impact of canagliflozin (CAN) a sodium-glucose transporter 2 inhibitor (SGLT2i), via regulation of BDNF/GSK-3β/IDE/Tau signaling pathway in streptozotocin (STZ)-induced sporadic Alzheimer's disease (SAD). Forty eight adult male Swiss albino mice were randomly allocated into four groups each 12 mice as the following: (1) control group received 0.9% saline both intracerebroventricular (ICV) once and distilled water by oral gavage for 21 consecutive days; (2) CAN group received 0.9% saline ICV once followed by freshly prepared CAN (10mg/kg/day; orally) for 21 consecutive days; (3) STZ model received single ICV-STZ (3 mg/kg; in (3 µl) 0.9% saline), and (4) The treated group where mice got STZ (3 mg/kg, ICV) once, and after five hours, mice received CAN (10 mg/kg/day; orally) and continued till day 21. On the 22th day after last dose, Morris Water Maze test (MWM) test was carried out, after that mice were euthanized and the brains were dissected for histopathological investigations and ELISA assay for brain derived neurotrophic factor (BDNF), glycogen synthase kinase-3β (GSK-3β), insulin degrading enzyme (IDE) content, and Tau. CAN restored STZ-induced cognitive dysfunction which is confirmed by improved latency time and number of entries in MWM, beside amelioration of histopathological changes. Furthermore, CAN treatment restored STZ-induced neurotoxicity through activation of BDNF pathway, subsequently reduction of GSK-3β, increased IDE, thus reducing Tau. Our findings demonstrated that the neuroprotective of CAN could be through modulation of BDNF/GSK-3β/IDE/Tau signaling pathway, thus it may act as a potential therapy for AD.

***Key words**: BDNF; Canagliflozin; GSK-3β; Sporadic Alzheimer's disease; STZ.*

Graphical Abstract



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Levetiracetam as Monotherapy or Add on Therapy in Patients with Epilepsy

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Abstract

A group of new antiepileptic drugs (AEDs) has been clinically established and used. Most of these drugs have new mechanisms of actions that differ from older drugs. Levetiracetam (LEV), a second generation AEDs, is a pyrrolidine derivate compound. The mechanism of action of LEV is different from older AEDs since, it reduces the epileptic seizures through binding to the synaptic vesicle protein 2A (SV2A) receptor. Some studies have reported that LEV, as monotherapy for patients with focal and generalized seizures and safer than AEDs. Other studies concluded that LEV can be used as add-on therapy (Any therapy that is given in addition to the primary or initial therapy to maximize its effectiveness) for patients with focal, myoclonic, and generalized tonic clonic seizures (GTCS). Its pharmacokinetic profile is favorable. It has less drug interaction with other AEDs. This article summarizes the clinical data of LEV as a potent in patients with generalized epilepsy.

Keywords: Levetiracetam, Epilepsy, Efficacy, Safety, Monotherapy, Add-on therapy

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Biography:

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Working in the field of research in collaboration with a team from faculties of pharmacy &Medicine concerning monitoring of serum erythropoietin level in patients with chronic HCV under antiviral therapy.

Evaluation of Vitamin E for the treatment of Muscle Cramps in Patients With liver Cirrhosis

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Abstract

Background: Muscle cramps are a troublesome recurrent symptom in a wide range of patients with cirrhosis of liver (22–88%) with unclear aetiology, possibly due to nerve dysfunction due to hyperexcitable motor neuron in patients with liver disease, altered energy metabolism because of diminished production of adenosine triphosphate (ATP) and contraction of plasma volume with or without abnormalities in the serum electrolytes. Although they frequently lead to sleep disturbance and impaired quality of life, evidence-based management guidelines are lacking due to paucity of clinical trials on their treatment options.

Aim: The current study aimed to compare the clinical effectiveness of alpha-tocopherol (vitamin E) in controlling muscle cramps in patients with liver cirrhosis to the routinely prescribed calcium and magnesium salts.

Methods: in 55 adult patients (17-60 years old) with liver cirrhosis associated muscle cramps recruited from the Tropical Medicine Clinic-Ain Shams University (El Demerdash) Hospital, vitamin E (200 mg three times a day; 25 patients) was tried to compare its ability to control muscle cramps with the routinely prescribed calcium and magnesium salts (30 patients). Patients were followed up for four months.

Results: after treatment with different medications, patients receiving calcium and magnesium salts, there were no significant differences in muscle cramps frequency/week, duration/min and presence of associated pain ($p>0.05$). On the other hand, patients receiving vitamin E; showed highly significant improvement in frequency, duration and associated pain after treatment. At the end of study period; there was a very highly significant decrease in the frequency and duration of muscle cramps ($p<0.001$), a highly significant decrease in duration of muscle cramps ($p<0.01$), and a significant decrease in the number of patients experiencing painful cramps in patients receiving vitamin E ($p<0.05$) as compared to those receiving calcium and magnesium salts

Conclusion: Current study results proved good efficacy for vitamin E in in controlling liver cirrhosis associated muscle cramps as well as a superior efficacy as compared to the routinely prescribed calcium and magnesium salts.

Keywords: vitamin E liver disease, cirrhosis, muscle cramp, calcium and magnesium salts

Evaluation of Short Term Effect of Atorvastatin on Myocardial Performance and Its Pleiotropic Effects in Heart Failure

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Abstract

Background: statins are used routinely in patients with coronary artery disease for their lipid lowering effects. Some clinical studies have found that statins do not affect clinical outcomes in patients with chronic heart failure (CHF), while others have found that statins have many beneficial effects. The aim of this study was to evaluate the pleiotropic effects of atorvastatin on patients with chronic heart failure of ischemic etiology (IHF) using conventional echocardiography and tissue doppler imaging.

Patient & Methods: Forty-eight patients with (CHF) were divided randomly into two equal groups; Atorvastatin group (received conventional therapy of HF plus atorvastatin 20 mg/d orally) and Control group (received conventional therapy only) for 3 months. Patients were examined both before and after treatment for biochemical tests; serum tumor necrosis factor α (TNF-α), serum high sensetive c reactive protein (hs-CRP), oxidized low density lipoprotein (ox- LDL), noradrenaline, adrenaline, renin, brain naturetic peptide (BNP-32), Troponin-I, total lipid profile and malondialdehyde. Conventional Echocardiography including left ventricle (LV) dimensions & wall thickness, ejection fraction (EF), E/A ratio, and tissue Doppler imaging (TDI) including Isovolumic contraction (IC), mitral annulus systolic velocity(S-peak), early (E) and late (A) diastolic peak velocities and Tei index were performed.

Results: Atorvastatin group showed statistically significant decreased in TNF- α, hs-CRP, ox-LDL, BNP-32 and noradrenaline compared to their baseline values before the study. Conventional echo failed to detect significant changes in each group except for significant increase in E/A ratio in atorvastatin group. DTI demonstrated that atorvastatin group showed significant improvement in systolic function [significant increase in S wave & isovolumic contraction (IC) peak velocities and better diastolic function [E peak velocity increased & E/E' ratio decreased significantly]. Tei index and heart rate improved significantly in atorvastatin group.

Conclusion: Atorvastatin improved cardiac function, decreased inflammatory and oxidative stress parameters as well as modulated the neurohormonal imbalance in CHF patients.

Keywords: Chronic heart failure atorvastatin pleitropic effects echocardiography tissue doppler imaging

The leukotriene receptor antagonist montelukast in the treatment of non-alcoholic steatohepatitis: A proof-of-concept, randomized, double-blind, placebo-controlled trial

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ABSTRACT

Non-alcoholic fatty liver disease (NAFLD) is associated with fat accumulation in the liver which can progress into non-alcoholic steatohepatitis (NASH). There is no specific treatment strategy for NASH. In this context, this study aimed at evaluating the efficacy and safety of montelukast in the treatment of patients with NASH. In this randomized double-blind placebo-controlled study, 52 overweight/obese patients with NASH were randomized into group 1 (n = 26) which received montelukast 10 mg tablets once daily, and group 2 (n = 26) which received placebo tablets once daily for 12 weeks. The fibro scan was used to assess liver stiffness as a primary outcome at baseline and 12 weeks post-treatment. Furthermore, patients were assessed for biochemical analysis of liver aminotransferases, metabolic parameters, TNF-α, 8-hydroXy-2′-deoXyguanosine (8-OHdG), liver fibrosis bio-markers including hyaluronic acid (HA) and transforming growth factor beta-1 (TGF-β1). Beck depression inventory questionnaire was used to report depressive symptoms. Data were statistically analyzed by paired and unpaired student's t-test and Chi-square test. A total number of 44 patients completed the study. The two groups were statistically similar at baseline. After treatment and as compared to baseline data and placebo, montelukast showed a statistically significant improvement in liver stiffness, liver enzymes, metabolic parameters (except LDL-C), TNF-α, 8-OHdG, and liver fibrosis biomarkers (HA and TGF-β1). Furthermore, montelukast was well tolerated and didn't provoke depression. In this proof-of-concept study, treatment with montelukast may represent a promising therapeutic strategy for patients with non-alcoholic steatohepatitis secondary to its efficacy and safety.
Clinicaltrial.gov ID: NCT04080947.

KEYWORDS: NASH, Montelukast, TNF-α, 8-OHdG, HA, TGF-β1, Liver stiffness.

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Biography:

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ADAM10 Gene Polymorphism and Its Relationship to Hepatocellular Carcinoma in Egyptian HCV Patients Receiving Direct-Acting Antiviral Therapies (DAAs)

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Abstract

Objective: The aim of this study was to investigate the ADAM 10 rs.653765 SNP genetic polymorphism in the hepatocellular carcinoma occurrence (de novo and post DAAs). **Methods:** This study was conducted on 360 participants divided to 4 groups. Group 1: 90 chronic adult patients infected with HCV received DAAs regimens and evolved HCC during the period of follow up. Group 2: Another 90 HCV patients received the same DAAs regimens and did not show HCC manifestations during the same follow up period. Group 3 included 90 de novo HCC patients (did not receive any DAAs). Finally, 90 apparently healthy participants as group 4. Clinical and laboratory data were evaluated, and ADAM 10 genotyping were performed using qPCR. **Results:** The study showed a statistically significant difference between HCC de novo and HCC deterioration on top of DAAs according to three scoring systems (Child Pugh, BCLC and HKLC) with p- value <0.05. Regarding ADAM10 gene polymorphism, the study showed a significant difference between CC versus CT+TT genotypes of HCC groups according to Child Bugh, BCLC and HKLC staging systems. Yet, no significant difference was found when ADAM10 genotypes and allele frequencies were compared between the four different studied groups. No difference in the survival rate between HCC de novo and on the top of DAAs but more aggressive stages with HCC on top of DAAs. **Conclusion:** ADAM10 genotypes did not show any significant association with HCC. Also, no differences in the death rate recorded between the de novo HCC and HCC post DAAs treatment with statistical significant worse staging of HCC post DAAs and were noted.

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Biography

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The effect of genetic variations on ribavirin pharmacokinetics and treatment response in HCV-4 Egyptian patients receiving sofosbuvir/daclatasvir and ribavirin

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Abstract

Purpose: This study aimed at investigating the effect of single nucleotide polymorphisms (SNPs) of genes involved in ribavirin (RBV) transport (SLC28A2 gene, ABCB1 gene, and ABCB11 gene) on the clinical outcome and pharmacokinetics of ribavirin in HCV- 4 Egyptian patients.
Method: 100 patients treated with sofosbuvir/daclatasvir and ribavirin for 12 weeks. The SNP genotyping was performed by real-time PCR using high resolution melting analysis. Ribavirin plasma trough concentrations were determined at week 4 of therapy using a liquid chromatography/tandem mass spectrometry (LC-MS/MS). For clinical outcomes, sustained virological response (SVR), ALT, AST, total bilirubin, albumin, serum creatinine, hemoglobin, leukocyte count, and platelet count were measured.
Results: Concerning RBV pharmacokinetics, ABCB1 2677 G>T SNP and ABCB11 1331 T>C SNP were statistically associated with RBV C_{trough} levels after 4 weeks of therapy. ABCB11 1331 T>C SNP revealed significant association with clinical outcomes (SVR). SLC28A2-146 A>T SNP has not showed any statistically significant association with RBV plasma levels or response.
Conclusion: SNP genotyping for ABCB1 and ABCB11 genes can help in better personalized medicine for maximizing response for ribavirin as explored by the significant association between polymorphism in ABCB1 and ABCB11 genes and ribavirin.

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Daprodustat , A New Era in Treatment of Anemia in Chronic Kidney Disease

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Abstract

Treatment of anemia in patients with chronic kidney disease (CKD) has been a matter of debate over the past 20–30 years.

The discovery of the hypoxia- inducible factor (HIF),one of the key regulators that controls how cells respond to hypoxic conditions, has diverted recent trials in this direction.HIF enhances kidney and hepatic erythropoietin synthesis and iron uptake by the intestine and opposes the deleterious effects of hepcidin. This discovery led to the creation of HIF prolyl hydroxylase inhibitors (HIF-PHIs), which are newer medications being developed to treat anemia in patients with CKD. These drugs offer the advantage of being dosed orally as opposed to existing ESAs, which are administered either intravenously or subcutaneously.

This process triggers multiple phenomena, including an increase in erythropoietin and transferrin production and in iron bioavailability and a decrease in hepcidin levels, which all aid in treating anemia in patients with CKD. HIF-PHIs (including roxadustat and vadadustat) have been approved in Japan; roxadustat has also been approved in China, South Korea, Chile, and the European Union, but recently, the US Food and Drug Administration (FDA) voted against roxadustat and vadadustat. FDA's Cardiovascular and Renal

Drugs Advisory Committee indicated that roxadustat's benefit-risk profile does not support approval for anemia of CKD in adults. Now, we should wait and see if the FDA will approve daprodustat to treat anemia in patients with CKD who are and are not on dialysis.

A randomized clinical trial found that daprodustat was noninferior to darbepoetin alfa in treating anemia of CKD and may represent a potential oral alternative to a conventional ESA in the ID population.

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Biography

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CYP2C19 Polymorphism in Ischemic Heart Disease Patients Taking Clopidogrel after Percutaneous Coronary Intervention in Egypt

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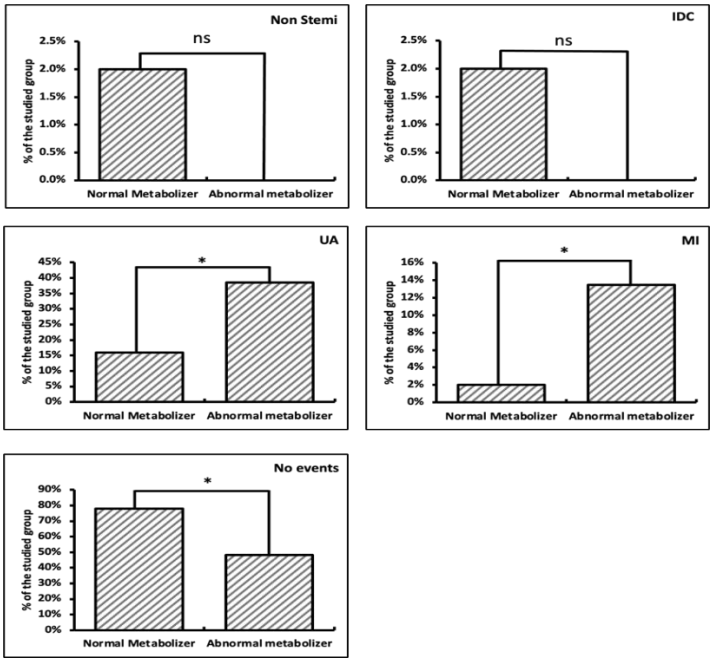
Abstract

Background: *Cardiovascular diseases (CVDs) are considered a leading cause of death worldwide. Allelic variation in the CYP2C19 gene leads to a dysfunctional enzyme, and patients with this loss-of-function allele will have an impaired clopidogrel metabolism, which eventually results in major adverse cardiovascular events (MACE). Ischemic heart disease patients (n=102) who underwent percutaneous cardiac intervention (PCI) followed by clopidogrel were enrolled in the present study.* ***Methods:*** *The genetic variations in the CYP2C19 gene were identified using the TaqMan chemistry-based qPCR technique. Patients were followed up for one year to monitor MACE, and the correlations between the allelic variations in CYP2C19 and MACE were recorded. Results: During the follow-up, we reported 64 patients without MACE (29 with unstable angina (UA), 8 with myocadiac infarction (MI), one patient with non-STEMI, and one patient with ischemic dilated cardiomyopathy (IDC)). Genotyping of CYP2C19 in the patients who underwent PCI and were treated with clopidogrel revealed that 50 patients (49%) were normal metabolizers for clopidogrel with genotype CYP2C19*1/*1 and 52 patients (51%) were abnormal metabolizers, with genotypes CYP2C19*1/*2 (n=15), CYP2C19*1/*3 (n=1), CYP2C19*1/*17 (n=35), and CYP2C19*2/*17 (n=1). Demographic data indicated that age and residency were significantly associated with abnormal clopidogrel metabolism. Moreover, diabetes, hypertension, and cigarette smoking were significantly associated with the abnormal metabolism of clopidogrel. These data shed light on the inter-ethnic variation in metabolizing clopidogrel based on the CYP2C19 allelic distribution.* ***Conclusion:*** *This study, along with other studies that address genotype variation of clopidogrel-metabolizing enzymes, might pave the way for further understanding of the pharmacogenetic background of CVD-related drugs.*

Keywords: *Cardiovascular; PCI; Clopidogrel; Egyptian; CYP2C19; Genotyping*

Graphical abstract

Comparison between normal and abnormal metabolizer according to follow-up for monitoring MACE.



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Microbiology & Immunology

Repurposing of paroxetine and fluoxetine: in vitro evaluation of antibacterial activity and its combination with levofloxacin

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Abstract

In recent years, due to the highly increase in and universal spread of bacterial resistance to a digit of usually utilized antibacterial agents, many studies have been shifted to investigating drugs whose essential therapeutic purpose is not antimicrobial action. In an period where it is becoming promising increasingly hard to explore new antimicrobial drugs, the repurposing of approved drugs becomes a future alternative. Therefore, the present study evaluated the antibacterial activity of psychotropic paroxetine and fluoxetine drugs, was determined in vitro, individually and in combination with levofloxacin antibiotic. The minimum inhibitory concentration (MIC), fractional inhibitory concentration index (FICI) were determined against *Staphylococcus aureus* strains. The tests were performed against 50 clinical isolates of *Staphylococcus aureus* from patients admitted to National liver institute and Menoufia University Hospitals. The SSRIs, nonantibiotic drugs, was given antibacterial activity against all *Staphylococcus aureus* strains tested. These drugs showed two synergistic events when combined with levofloxacin against *Staphylococcus aureus* MDR clinical isolate. Statistical analysis determined significance of psychotropic drugs when associated with levofloxacin. Paroxetine and Fluoxetine presented bactericidal activity against clinical isolates. Our results suggest the repurposing of these two antidepressants beside antibiotic therapy for the treatment of *Staphylococcus aureus* infections. However, furthermore studies on the mechanism of action of these drugs in relevance to antibacterial activities are necessary in order to increment the safety of their use.

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Biography

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Staphylococcus aureus resistance towards linezolid and sensitivity to silver nanoparticles

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Abstract

It has been reported that there are several linezolid resistance mechanisms in the human pathogen methicillin-resistant *Staphylococcus aureus* (MRSA). This study aimed to detect the molecular features of methicillin-resistant S. aureus with increased linezolid minimum inhibitory concentrations (MICs). Silver nanoparticles (AgNPs) synthesized from rosemary leaves (Rosmarinus officinalis) and from S. aureus were used to determine whether this antimicrobial effect of these nanoparticles can help in inhibition of resistant S. aureus strains. One hundred Staphylococcus aureus isolates were isolated from blood (51%), wound swabs (20%), sputum (14%), urine (8%) and pus of 100 patients. Staphylococcus aureus was identified using the traditional biochemical tests and light and electron microscopy. Antibiotic susceptibility test of all isolates was achieved toward 16 antibiotics using disc diffusion method. Eighty one (81%) of the isolates were MRSA, and twenty (20%) were linezolid resistant using disc diffusion method. Using agar dilution method for determination of MICs, 12 isolates were linezolid resistant (LRSA). Molecular confirmation of linezolid resistant S. aureus was done by detection of nuc gene and sequencing of 16s rRNA gene. Molecular analysis for the resistant isolates showed that domain V of 23srRNA, rplC and rplV genes were detected in all isolates, while cfr gene was not detected in any isolate. DNA sequencing showed that the major mutation we found in our isolates was G to A mutation at different positions in spite of the presence of T2500A mutation. Well diffusion method was used for examination of antimicrobial effect of silver nanoparticles (AgNPs). There was a significant antimicrobial effect of AgNPs synthesized from both rosemary leaves and S. aureus toward VRSA and LRSA isolates

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Facing global antibacterial resistance threats

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Abstract

Infectious diseases pose a serious threat to public health because of the limitations of available treatment options. Recently, the introduction of new anti-virulence agents has been a successful strategy by repurposing drugs designed for different indications with the extra benefit of known pharmacokinetic profiles and safety. Other promising strategies include anti-evolution drugs, immunotherapies, and bacteriophages. Antivirulence therapies target the ability of pathogens to cause disease rather than suppressing their growth. Thereby, they decrease the selective pressure on bacteria and prevent the development of resistance to these antibiotics. Several anti-virulence strategies have been investigated, such as blocking bacterial adhesion, disrupting biofilm formation, toxin neutralization, inactivating specialized secretion systems, quorum sensing interference, and hindering virulence gene regulation. Anti-evolution drugs block the mutational and evolutional capacities of microorganisms. These drugs target DNA translocase such as Mfd protein. This protein is an "evolvability factor" that promotes mutagenesis and is required for rapid resistance development to all antibiotics. Drugs that target Mfd could be co-administered with antibiotics during the treatment of infections in order to reduce the likelihood of resistance development. The immunotherapy-based treatments target or affect the innate and/or adaptive immune responses and could be effective in treating different pathogenic infections. Monoclonal and polyclonal antibodies directed to poly-N-acetylglucosamine (PNAG) showed potential in the prevention and treatment of multidrug-resistant (MDR) bacterial isolates. Phage therapy employs viruses to treat several bacterial infections specifically. Obligately lytic phages kill bacteria by making them burst or lyse. In conclusion, the combined use of antibiotics and these superior agents is a breakthrough in combating superbugs because of its advantages in curing bacterial infections and limiting the spread of antibiotic resistance. More research is required to determine the effectiveness of these agents and investigate their possible side effects.

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An Update and Future Perspective in Vaccines Preclinical and Clinical Development

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Abstract

Vaccines are essential for maintaining global health since they stop the spread of numerous diseases both locally and internationally. In addition, vaccines have a considerable economic benefit by lowering the cost of illnesses and hospital stays. Traditional vaccine technologies have been used against many bacterial and viral pathogens, but there are a number of cases where they have failed, including persistent infections, rapidly evolving pathogens with high sequence variability, complex viral antigens, and emerging pathogens, as well as the fact that these vaccines are expensive and time-consuming to develop and produce. Major dangers to world health now emerge from newly emerging and reemerging diseases, including Ebola virus, Zika virus, and most recently, severe acute syndrome respiratory coronavirus 2 (SARS-CoV-2). Combating outbreaks requires the rapid development of vaccines, which has not historically been attainable with traditional vaccine technologies. The development of safe, effective, and affordable technologies for vaccines has been the focus of vaccine technology research over the past 20 years in a number of different ways. This review provides an overview of the current state of novel vaccine technologies, new vaccine candidates in clinical trial phases 1–3, and vaccinations based on novel technologies that have already been commercially available, with special reference to pandemic COVID-19 vaccines

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Pharmaceutical & Organic chemistry

New Multi-targeted Anti-Alzheimer's Agents

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Abstract:

The widespread and the recognition of the multifactorial nature of Alzheimer disease (AD) increased the demands for multi-targeted directed ligands (MTDLs) to overcome possible drug-drug interactions of the combination therapy, and to acquire superior therapeutic profile than single targeted molecules. Two main scaffolds namely: pyrazolo pyridine and tetrahydro acridine (THA) were used to synthesize four different series of integrated multi-targeted synthons possessing ChE (hAChE or hBuChE), Aβ1-42 aggregation inhibition potency, in addition to optimum metal chelating capability. Structure modifications were performed to 9-amino function of THA core of tacrine and the pyrazolo pyridine scaffolds linked to a variety of cyclic secondary amines directly or using amide spacers or Ethylamine Bridge or engaging THA with pyrazolo pyridine to produce hybrid compounds. Different 9-amino substitutions improved the in vitro hAChE activity of 7- or 6,7-disubstituted THA derivatives. Compounds 16 and 28 proved to be multimodal anti-AD agents as they were potent hAChE inhibitors, in addition, they could bind with the amino acids of the peripheral anionic site (PAS) affecting Aβ aggregation and hence Aβ-dependent neurotoxicity especially compound 16 which was almost twofold more active than donepezil. Furthermore, both compounds directly inhibited Aβ1-42 self-aggregation and chelated bio-metals such as Fe2+, Zn2+ and Cu2+ preventing reactive oxygen species (ROS) generation by Aβ and its oxidative damage in the brain regions of AD patients. Compound 28 had superior privilege by its dual ChE activity resulting in better cognitive improvement. Compounds 16 and 28 showed acceptable relative safety upon hepG2 cell line and excellent BBB penetration with wide safety margin as their LD50 were higher than 120 mg/kg.

Biography:

Hussein I. El-Subbagh, Professor of Medicinal Chemistry. In 2016 Dr. El-Subbagh received D.Sc. degree from University of Mansoura; 1988 he received his Ph.D. from University of Rhode Island, USA and University of Mansoura, Egypt. In 1996, he was awarded "Alexander von Humboldt" fellowship at University of Bonn, Germany. He received several recognitions including "Shoman Award" for the Young Arab Scientists in Chemistry - Amman, Jordan, 1994; the "State Prize for Encouragement of Science", Academy of Scientific Research and Technology, Egypt, in 1997; "Waleed Kayali Prize for Scientific Research" Saudi Pharmaceutical Society, Riyadh, Saudi Arabia, 2008; FUE outstanding research award, 2012; "State Prize for Scientific Distinction", Academy of Scientific Research and Technology, Egypt, in 2015, Presidential Medal of Science and Arts 2017, "State Prize for Appreciation", Academy of Scientific Research and Technology, Egypt, in 2020. Also He is on the list of expertise of EACEA-Erasmus+, European Commission. His scientific production is reported in more than 128 publications in leading International Journals and ten US & European patents. His "h-Index" reached 33 according to "SCOPUS" data base evaluation system. subbagh@yahoo.com

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New benzothienopyrimidine derivatives as dual EGFR/ARO inhibitors: Design, synthesis, and their cytotoxic effect on MCF-7 breast cancer cell line

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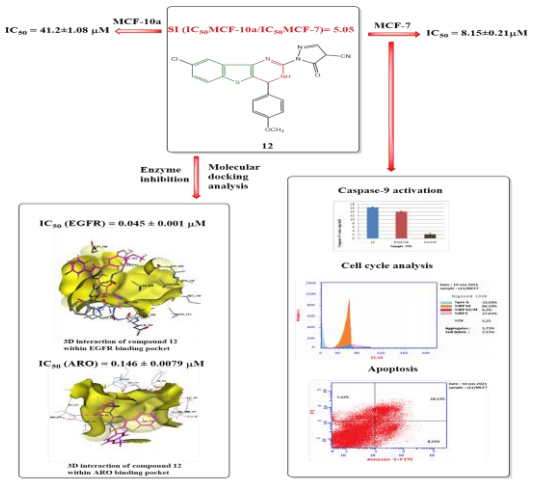
Abstract

New cytotoxic agents based on benzothienopyrimidine scaffold were designed, synthesized, and evaluated against the MCF-7 breast cancer line in comparison to erlotinib and letrozole as reference drugs. Eight compounds demonstrated up to 20-fold high anticancer activity than erlotinib, and five of these compounds were up to 11-fold more potent than letrozole in MTT assay. The most promising compounds were evaluated for their inhibitory activity against EGFR and ARO enzymes. Compound 12, which demonstrated potent dual EGFR and ARO inhibitory activity with IC50 of 0.045 and 0.146 µM, respectively, was further evaluated for caspase-9 activation, cell cycle analysis, and apoptosis. The results revealed that the tested compound 12 remarkably induced caspase-9 activation (IC50 = 16.29 ng/ ml) caused cell cycle arrest at the pre-G1/G1 phase and significantly increased the concentration of cells at both early and late stage of apoptosis. In addition, it showed a higher safety profile on normal MCF-10A cells, and higher antiproliferative activity on cancer cells (IC50 = 8.15 µM) in comparison to normal cells (IC50 = 41.20 µM). It also revealed a fivefold higher selectivity index than erlotinib towards MCF-7 cancer cells. Docking studies were performed to rationalize the dual inhibitory activity of compound 12.

Graphical Abstract



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Novel xanthine hybrids as potential apoptotic antitumor agents

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Abstract:

Cancer is one of the primary causes of death universal [1]. Most patients who have been diagnosed with cancer suffer from poor quality of life due to adverse proceedings associated with cancer [2]. One of the most effective methods of suppressing tumor growth and tumor eradication is chemotherapy [3]. However, many patients undergoing chemotherapy have associated side effects such as thrombocytopenia, anemia, nausea and vomiting [4]. Nowadays, the challenge for medicinal chemists is finding new anticancer agents with improved efficacy and high degree of safety toward normal host cells. Methylxanthine derivatives such as caffeine (1) and theophylline (2) were found to induce apoptosis, and promote cytotoxicity induced by doxorubicin [7]. Theophylline was found to induce programmed cell death in various human cancer cell line and in a malignantly transformed granulosa cell line when synergizing with gemcitabine or cisplatin [8]. Recent studies demonstrated that molecular hybridization of chalcone units with biologically active pharmacophore produced new hybrids with synergistic biological activity [13]. Encouraged by all these facts, our work aimed at gathering two bioactive entities NO releasing oxime or acetylated chalcone and xanthine derivative in only one compact hybrid structure for the purpose of synergism and/or decreasing the expected adverse effects. Synthesis of novel hybrid compounds based on xanthine and chalcone pharmacophores through S-alkylation of 1,3,8-trisubstituted and 1,8-disubstituted xanthine derivatives with different acetylated chalcones.

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Evaluation of the in silico anti-aging potentiality of volatile constituents from Coriander (Coriandrum sativum L.) fruits

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Abstract:

Anti-aging pharmaceutical products contribute to the control and prevention of signs of skin photo-aging. Most anti-aging products are one of the most expensive skin care pharmaceuticals in the world. A shift towards natural anti-aging ingredients has driven the research to find scientific evidence for traditionally used plants as anti-aging agents. In this context, Coriandrum sativum L. was recently evaluated for its in vitro as well as in vivo anti-wrinkling properties revealing promising activities. Thus, in this study, the molecular docking activity was carried out for the major volatile constituents in coriander (C. sativum L.), linalool, terpinene, camphor and α-pinene, against matrix metalloproteinase 1 (MMP-1) due to their main role in wrinkles, the findings of in silico study revealed that linalool exhibited promising anti-aging potentiality. In conclusion, this study indicates that the major volatile constituent of C. sativum L., linalool, has the potential to be developed as a new drug for skin aging.

Keywords: In silico, anti-aging, volatile constituents, Coriander, linalool

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New benzothienopyran and benzothienopyranopyrimidine derivatives as topoisomerase I inhibitors: Design, synthesis, anticancer screening, apoptosis induction and molecular modeling studies

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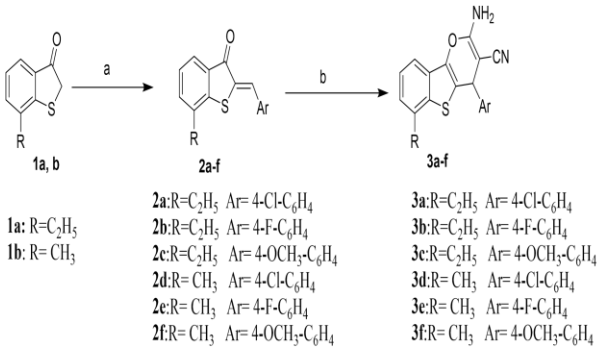
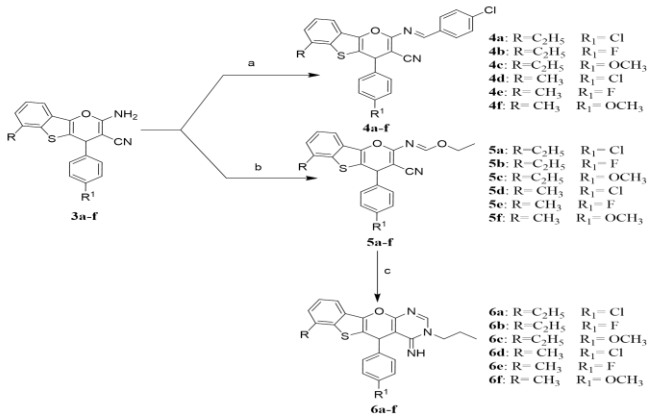
Abstract:

New benzothienopyran and benzothienopyranopyrimidine derivatives were synthesized based on the structural requirements of topoisomerase I inhibitors. All target compounds exhibited strong cytotoxic activity with GI50 range of 70.62% - 87.29% in one dose NCI (USA) screening against 60 human tumor cell lines. Among the tested derivatives, eight compounds namely 4d, 4e, 4f, 5b, 5e, 6b, 6d, and 6f demonstrated broad spectrum and potent anticancer efficacy in five dose screening against all tested panels. DNA relaxation assay for the latter compounds showed that 4d, 5b, and 6f exhibited excellent inhibitory activity with IC50 range of 2.553 - 4.495 µM as compared to indenoisoquinoline reference drug. Moreover, the most active compounds were investigated for being topoisomerase poisons or catalytic inhibitors using DNA nicking assay. Compounds 4d and 6f were found to be potential Topo I poisons, whereas compound 5b has acted as Topo I suppressor. Analyzing cell cycle and induction of apoptosis for the most active compound 4d, revealed growth arrest at the S phase in MDA-MB-435 cells similarly to indenoisoquinoline reference drug. Additionally, in silico molecular modeling study for eight most active cytotoxic compounds in five dose screening demonstrated interaction with DNA as well as distinctive binding pattern similar to the reference indenoisoquinoline, indicating that the newly discovered targets are supposed to be promising candidates as Topo I inhibitors.

Keywords
Bezothienopyran,benzothienopyranopyrimidine, topoisomerase inhibitors, cell cycle analysis, apoptosis, cytotoxic agents, molecular modeling



Reagents and conditions: a) appropriate aromatic aldehyde, anhydrous sodium acetate,glacial acetic acid reflux for 2 h. **b)** $CH_2(CN)_2$, piperidine, abs.ethanol, reflux for 5 h.



Reagents and conditions: a) 4-chlorobenzaldehyde, dry toluene, reflux 24h. **b)** $HC(OC_2H_5)_3$, $(CH_3CO)_2O$, reflux 2h. **c)** n-propylamine, EtOH, stirring for 1h.

Scheme 1. The synthetic pathway for the preparation of the starting 2-amino benzothienopyrans **3a-f**

Scheme 2 The synthetic approach for the synthesis of **4a-f, 5a-f** and **6a-f**.

Discovery of Certain Oxindole-based Small Molecules as Novel Anticancer Agents with Pro-Apoptotic Activity

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Abstract

In continuation of our endeavor with respect to the development of potent and effective 2-indolinone-based anticancer agents, herein we report the synthesis of two novel series of 2-indolinones **4a-o** and **5a-e**. The *in vitro* anti-proliferative potential of the synthesized compounds **4a-o** and **5a-e** was examined against HT-29 (colon), ZR-75 (breast) and A-549 (lung) human cancer cell lines. Compounds **5b**, **5d** and **5e** are the most active congeners against the tested cancer cell lines with average IC_{50} values of 4.77, 3.39 and 2.37 µM, respectively, as compared with the reference isatin-based drug, sunitinib, which exhibited an average IC_{50} value of 8.11 µM. Compound **5e** was selected for further pharmacological evaluation in order to get insight into its possible mechanism of action. It increased caspase 3/7 activity 2.4- and 1.85-fold between 4 and 8 h of treatment, respectively, at 10 µM concentration and it caused a decrease in the percentage of cells in the G1 phase of the cell cycle with corresponding increase in the S-phase. In addition, compound **5e** increased phosphorylated tyrosine (P-Tyr) levels nearly twofold with an apparent IC_{50} value of 3.8 µM.

Aminopyridone-linked benzimidazoles: A fragment-based drug design-guided approach for the development of novel CDK-9 inhibitor anticancer molecules.

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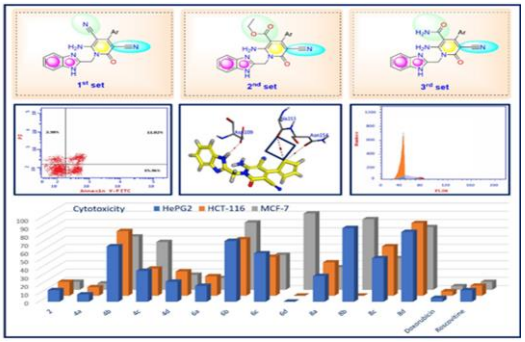
Abstract: Concerning the structural survey of versatile CDK-9 inhibitors, a fragment-based design and synthesis of three novel series of aminopyridone-linked benzimidazoles as potential anticancer candidates with significant CDK9 inhibition was implemented. All synthesized compounds were submitted to one dose NCI assay against sixty tumor cell lines as well as seven dose cytotoxicity evaluation toward HepG2, HCT-116, and MCF-7 cells. Among them, compounds 2, 4a, 4c, 4d, 6a, and 8a exhibited moderate to significant cytotoxicity and selectivity toward the selected cell lines with IC50 range equal 7.61-57.75 µM and SI range of 0.76-8.07 exceeding that of roscovitine (IC50 of 9.32-13.82 µM and SI of 0.93-1.38). As well, compound 4d containing thienyl and cyano moieties at positions 4 and 5 of pyridine ring, respectively exerted a lethal effect against colon HT29 cell line with a lethality percent of 92.96%. Consequently, the most active cytotoxic agents were selected to determine its proposed mechanism both in vitro (CDK-9 inhibition, apoptosis stimulation, and cell cycle analysis) and in silico (molecular modelling study). Particularly, compounds 4a, 6a, and 8a containing 4-chlorophenyl core at C-4 in the pyridine ring displayed potent CDK-9 inhibition with IC50 value of 0.424 – 8.461 µM, among which compound 6a bearing ethyl carboxylate group at C-3 of pyridine ring showed the superior activity. The suggested mechanism for 6a was further evaluated through determining its effect on MCF-7 cycle and apoptotic and anti-apoptotic gene expression. The results demonstrated that compound 6a was believed to arrest the cell cycle at S phase and induce apoptosis in MCF-7 cells. It also induced apoptosis via variable approaches comprising elevation of Bax, Caspase-8, and Caspase-9 markers that was accompanied by a decline of Bcl-2 gene. Additionally, molecular docking provoked the prominent interaction of 6a with CDK-9 binding pocket.

Graphical Abstract



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Biography

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Synthesis of 1,2,3-triazole-dual dithiocarbamate hybrids as anticancer agents

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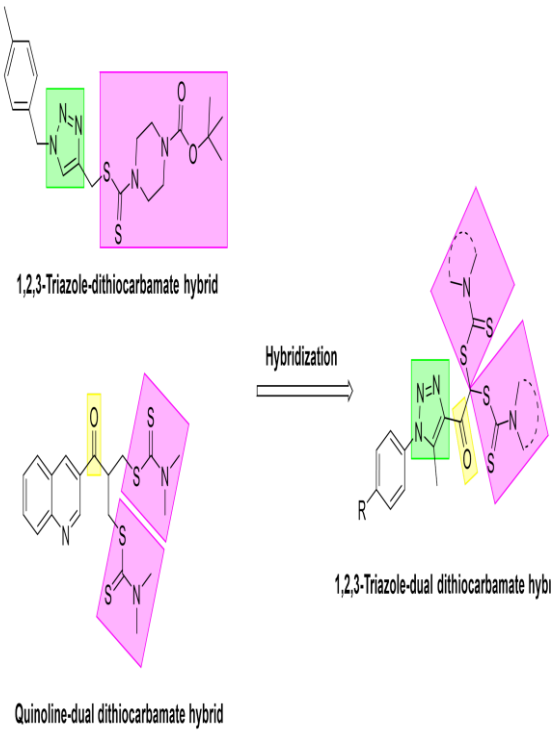
Abstract

Cancer is a vital public health concern, and set to become a major cause of morbidity and mortality globally in the next few decades. The discovery of new chemotherapeutic agents capable of inhibiting the proliferation of cancer cells remains a challenge in anticancer research.1,2,3-Triazole is a privileged building block in the discovery of new anticancer agents. Besides, dithiocarbamates have been derivatized with various heterocycles and explored for their potential anti-cancer activity. For example, 1,2,3-triazole-dithiocarbamate hybrid, synthesized by Zheng *et al.*, exhibited potent and selective cytotoxic activity against gastric cancer cell lines (MGC-803, HGC-27) with profound inhibition of tumour growth *in vivo.* Moreover, quinoline-dual dithiocarbamate hybrid, synthesized by Li *et al.*, displayed potent inhibitory activity against H460 cells with IC_{50} value of 0.4 µM along with inhibitory activity against HepG2 (IC_{50} = 54 nM) and MCF-7 (IC_{50} = 23 nM) cancer cells. Therefore, in the present investigation, a series of 1,2,3-triazole-dual dithiocarbamate hybrids were prepared for evaluation of anticancer activity against a panel of NCI-60 cancer cell lines. The synthesis of this framework was achieved *via* a one-pot multi component reaction of secondary amines, carbon disulfide and di-bromoacetyl triazole under presence of a catalytic base $Na_3PO_4.2H_2O$ in DMF as a solvent at room temperature. The desired hybrids were produced in good to excellent yield (51-99%) as pure solids and confirmed spectroscopically through IR, ^{1}H-NMR, ^{13}C-NMR analysis.

Graphical Abstract



Pharmacognosy

Antioxidant potential of selected Apiaceae plant extracts: A study focused on the chemical composition and neuroprotective effect of Coriandrum sativum L. extract against lead (Pb)-induced neurotoxicity in rats.

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Abstract

Several Apiaceae species have been used traditionally as food flavoring and medicine, representing a rich source of bioactive phytopharmaceuticals. In the present study, the antioxidant activity of four Apiaceae extracts (*Foeniculum vulgare* L., *Pimpinella anisum* L., *Coriandrum sativum* L. and *Cuminum cyminum* L.) were evaluated. Additionally, the metabolite profiles of the selected species were comprehensively analyzed by untargeted liquid chromatography electrospray ionization tandem mass spectrometry (LC/ESI-MS/MS) coupled to chemometry, where 71 metabolites were annotated from the tested species covering several classes of specialized metabolites, including phenolic acids and flavonoids. Moreover the extract showed the highest radical scavenging activity and reducing power. Coriander was further subjected to *in vivo* evaluation of its protective effect against Lead (Pb)-induced neurotoxicity. Administration of coriander extracts improved the short and long term memory performance and also decreased hippocampal Pb content in Pb-intoxicated rats. Moreover, it attenuated hippocampal oxidative stress, neurochemical changes, and exhibited anti-inflammatory effect in the hippocampal tissue of Pb-intoxicated rats. Further, coriander extract attenuated Pb inhibitory effect mTORC1& Ikk-β pathway resulting in upregulation of of P-P70S6K and PS6. Thus, in this study, the molecular docking activity was carried out for for the selected compounds presented in coriander (C. sativum L.) extract against mTOR-1 and Ikk-β due to their main role as neuroprotective. The present findings highlights the future pharmaceutical utilization of coriander extract as valuable source of phenolic compounds that can be used as antioxidant and neuroprotective agents against Pb-induced oxidative stress.

Key words: Apiaceae; Pb toxicity; Phenolics; Coriander; Antioxidant; Metabolomics, In silico

Antidiabetic activity of doum palm (*Hyphaene Thebaica* L. MART.) leaves extract

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Abstract

Background: *Hyphaene thebaica* L. Mart. (Doum-palm), rich in total phenolics content, is known for its medicinal value in the treatment of several health conditions, such as hypertension, and diabetes mellitus. Aim of the Study: To investigate the hypoglycaemic activity of the dichloromethane, ethyl acetate, and aqueous fractions from doum palm leaves. Then, to characterize the metabolic profile of the most active fraction by LC-HR-MS/MS analysis to detect the responsible metabolites for this activity. Material and Methods: The present study examined the in vitro inhibitory effect of the extract fractions from Doum Palm Leaves at concentrations ranging from 7.81 to 1000.00 µg/ml on α-glucosidase activity, an enzyme responsible for carbohydrate-hydrolysis to monosaccharides and intestinal glucose absorption. Metabolic profiling for the dichloromethane fraction was obtained with LC-HRMS/MS. Results: The dichloromethane (DCM) fraction inhibited α-glucosidase activity in vitro with an IC_{50} of 52.40 µg/ml. Twenty-three compounds were identified in the DCM fraction by LC-HR-MS/MS analysis. Most of them were reported for their potential antidiabetic activity. Nevertheless, the III-DCM subfraction (IC_{50} 3.79 ± 0.17 µg/ml) and the IV-DCM subfraction (IC_{50} 5.13 ± 0.24 µg/ml) had the best inhibitory activity against α-glucosidase compared with acarbose (IC_{50} 2.33 ± 0.11 µg/ml). Conclusions: The results support the use of these fractions obtained from Doum palm leaves to effectively inhibit a crucial enzyme linked to type 2 diabetes and suppress carbohydrate absorption from intestine, and thereby reducing the postprandial increase of blood glucose.

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Biography

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Investigation of the phytochemical composition, antibacterial, anti-osteoarthritis and wound healing activities of selected vegetable waste

Mohamed A. Salem[1,*], Osama G. Mohamed[2,3], Esraa M. Mosalam[4], Aya Ibrahim Elberri[5], Hend Mohamed Abdel-Bar[6], Mariam Hassan[7,8], Ahmed A. Al-Karmalawy[9], Ashootosh Tripathi[3,10], Shahira M. Ezzat[2,11] and Hend E. Abo Mansour[4]

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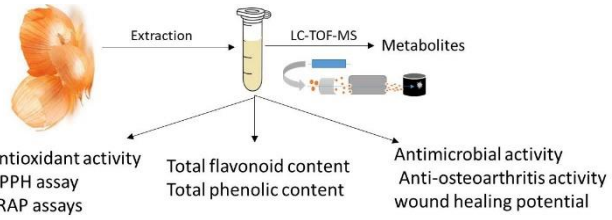
Abstract

Agri-food wastes are produced following the industrial food processing. Although they are mostly discarded causing environmental hazards, their bioactive metabolites accounts for nutritional and medicinal values. Thus, comprehensive analytical and biological evaluation of selected vegetable byproducts (potato, onion and garlic peels) have been developed. Phytochemical composition has been performed using HPLC-ESI-qTOF-MS in combination with molecular networking. Further, evaluation of the antimicrobial, anti-osteoarthritis and wound healing potential were also tested. The first two activities were performed *in vitro*, while the third was evaluated *in vivo*. So, we assessed the impact of the tested peel extracts on IL-1β-induced inflammation in mouse isolated chondrocytes. Also, we measured chondrocyte expression of key osteoarthritis-associated factors such as matrix metalloproteinase 13 (MMP-13), nitric oxide (NO), collagen II, NF-κB p65 as well as the expression of inflammatory mediators in chondrocytes such as interleukin 6 (IL-6), tumor necrosis factor-α (TNF-α), cyclooxygenase-2 (COX-2), and inducible nitric oxide synthase (iNOS). In total, 47 compounds were identified, where phenolic acids, flavonoids, saponins and alkaloids were the most representative chemical classes. The higher polyphenolic contents, the promising antioxidant capacity and the potential anti-osteoarthritis activity were found in onion peels. In addition, onion peel extract showed promising antimicrobial activity, especially against MRSA. Lastly, onion peel extract was proven to have promising wound healing, where it restored tissue physiology and integrity. These results demonstrate that vegetable byproducts, particularly, those derived from onion peels have potential antioxidant and activities and can be incorporated as natural by-product for future evaluation against wounds and osteoarthritis.

Graphical abstract



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Biography

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Approach to Pharmacological Properties and Chemical Constituents of Selected Apiaceous Plant Species.

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Abstract:

Umbelliferae (Apiaceae) family represents one of the largest plant families. It is mainly distributed in the Mediterranean countries. The most frequent Apiaceous members that used traditionally are coriander, cumin, fennel and anise. Apiaceae family is considered a potential source of bioactive metabolites such as essential oils, phenolic compounds, polyacetylenes and terpenoids. Different pharmacological experiments in a number of in vitro and in vivo models have convincingly demonstrated the ability of Apiaceae family to exhibit antifungal, antibacterial, antioxidant, antiaging and hepatoprotective activities, lending support to the rationale behind several of its therapeutic uses. The present review highlights the fragmented information described in literature concerning the chemical compœition and the biological activities of essential oils and different extracts of some Apiaceae species; it illustrates also their potential for the development of pharmacœutical, cosmetic products and other industrial uses.

Keywords: Phytoconstituents, Pharmacological effects, Apiaceae, Fennel, Anise, Coriander and Cumin

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Biography:

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Cytotoxic and Antimicrobial activities of secondary metabolites isolated from *Aspergillus quadrilineatus* derived from the algae *Corallina Officinalis*

Sherif M Shama [1], Ahmed M. Elissawy [2,3], Mohamed A. Salem [1], Fadia S. Youssef [2], Mohamed S. Elnaggar [2,3], Hesham R. El-Seedi [4,5], Dalia Ibrahim Hamdan [1] and Abdel Nasser B. Singab[2,3]

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Abstract

Emestin (**1**) & sterigmatocystin (**2**) were isolated from the ethyl acetate extract of the marine derived fungus *Aspergillus quadrilineatus*,.The structures and relative configuration of the isolated compounds were unambiguously determined based on HR-ESI-MS- and extensive 1D and 2D NMR spectroscopic analyses. The Ethyl acetate extract and the isolated compounds **1** and **2** were evaluated for *in vitro* cytotoxic and antimicrobial activities; where Emestrin showed significant cytotoxic activity against HepG2, MCF-7 and Hela cancer cells with IC_{50} values of (0.58 ± 0.08 µg/ml, 1.61 ± 0.17 µg/ml and 1.87 ± 0.17 µg/ml respectively, compared with sterigmatocystin with the IC_{50} values of 4.73 ± 0.57µg/ml, 8.54 ± 0.84 µg/ml and 13.64 ± 0.92 µg/ml respectively and total fungal extract with the IC_{50} values of (11.74 ± 0.98 µg/ml, 14.9 ± 1.04 µg/ml and 18.66 ± 1.73 µg/ml respectively). Moreover, emestrin exhibited significant antifungal (against *A. fumigatus*, MIC, 39.06) and antibacterial activity against MRSA and *E. coli* with MIC 39.06 and 19.53, respectively.

Graphical abstract

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Biography

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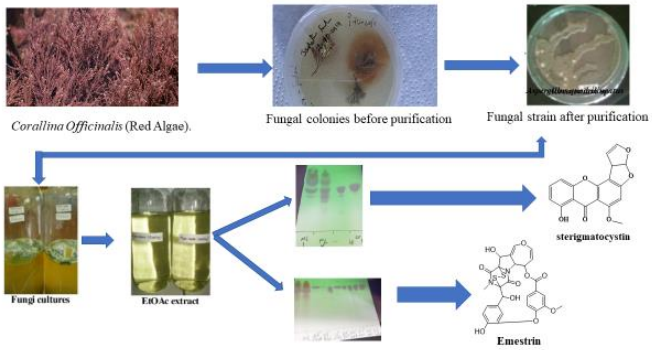

Comparison between Eggshell membrane from White and Brown Chicken Eggs via HPLC Quantification of Glucosamine Sulfate

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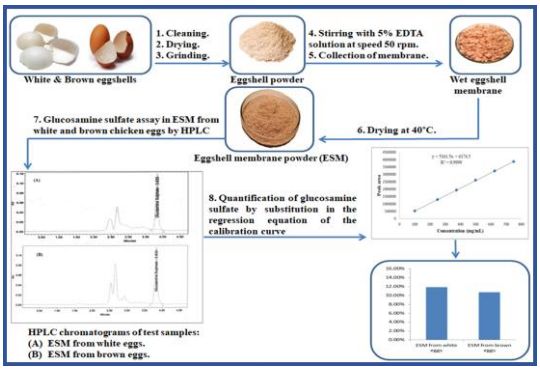
ABSTRACT

Eggshell membrane (ESM), a thin membrane lining the eggshell of chicken eggs, is a natural byproduct attracting the attention of many researchers worldwide due to its valuable composition and beneficial biological activities. Its main active ingredients include collagen (types I, V, X), glucosamine sulfate, chondroitin/dermatan sulfate, and hyaluronic acid, so it possesses a beneficial value for maintaining healthy joints. Variation in eggshell color/breed of hens has been reported to affect the quality and composition of eggs and eggshells. So, the current study aimed to compare glucosamine sulfate content in ESM separated from white and brown eggs using the HPLC technique and UV detection at 195 nm. The peak area quantification method was used to determine the concentration of glucosamine in both samples. Results revealed that ESM separated from white eggs has a higher content of glucosamine sulfate (11.83% w/w) than ESM separated from brown eggs (10.68% w/w). We conclude that the use of ESM from white eggs may be more valuable than ESM from brown eggs in further biological studies to determine the effect of ESM in the prevention and management of osteoarthritis.
Keywords: Eggshell membrane; glucosamine sulfate; HPLC; white eggs; brown eggs

Graphical Abstract



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Biography:

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Bio-guided chemical characterization and nano-formulation of selective edible volatile oils with potential antibacterial and anti-SARS-CoV-2 properties.

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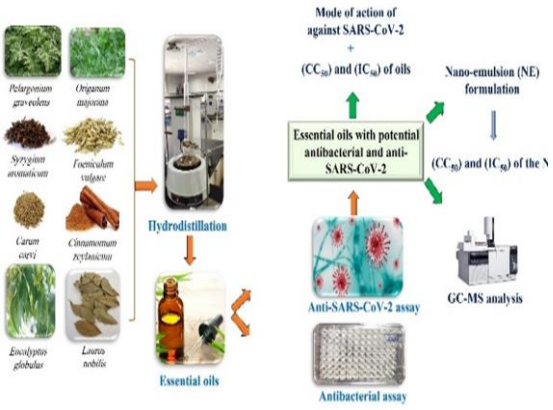
Abstract

The current severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) pandemic has made the respiratory system more vulnerable to possible dangers. One of the most crucial approaches to treating the upper respiratory tract is the identification of medications from natural sources. In this investigation, we examined the efficacy of formed essential oils (Eos) against Gram-positive (*S. aureus*, *E. fecalis*) and Gram-negative *(E. coli*, *K. pneumonia*, and *P. aeruginosa*) bacteria and against the SARS-CoV-2 virus, with the mode of action investigated as anti-SARS-CoV-2. The best antibacterial oils were *Syzygium aromaticum* and *Cinnamomum zeylanicum*. MIC values for *C. zeylanicum* EO against *E. coli*, *K. pneumoniae*, *P. aeruginosa*, *S. aureus*, and *E. fecalis* were 1, 1, 2, 0.5, and 8 g/mL, whereas *S. aromaticum* EO displayed values of 8, 4, 32, 8, 32 g/mL. VERO-E6 cells were used to assess the cytotoxic activity of the oil samples, and the results of the (MTT) assay revealed that *Foeniculum vulgare* was the least poisonous oil, followed by *Laurus nobilis*, *Carum carvi*, *S. aromaticum*, and *Eucalyptus globulus*. With IC_{50} values of 15.16 and 96.5 g/mL, respectively, *C. zeylanicum* oil and *S. aromaticum* were the most effective antiviral Eos. Additionally, *S. aromaticum* EO's safety index (26.3) was higher than *C. zeylanicum*'s (7.25). Both the virucidal action and its impact on viral proliferation may play a role in how *C. zeylanicum* oil exerts its antiviral activity. The same bacterial and viral strains were used to manufacture the nano-emulsion dosage form of the powerful EOs and reassess it. Finally, using a GC-MS approach, the chemical characterization of these promising essential oils was examined and identified.

Graphical Abstract



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Biography

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The *n*-Butanol Fraction of *Tamarix nilotica* Flowers: Chemical Profiling and Cytotoxic Potential

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Abstract

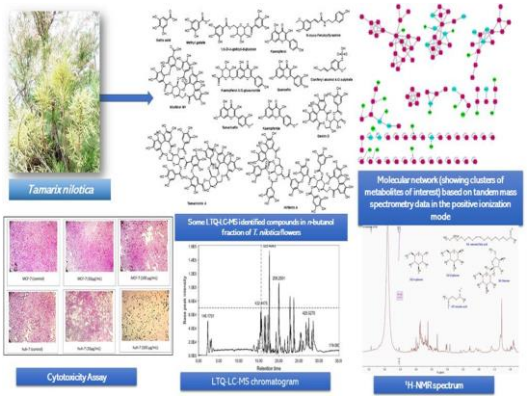
Background: One of the main healthcare problems facing people today is cancer, and finding new treatments or developing existing ones with fewer side effects will be a major challenge for researchers. Halophytes are found all over the world in arid environments like dunes and inland deserts, where they produce crucial secondary metabolites that are highly prized in the medical industry. There are several halophytic *Tamarix* species. Native to Egypt, *T. nilotica* has a rich history in its culture and is used in folk medicine to cure a variety of illnesses and is documented in Egyptian papyri.

Methods: LC–LTQ–MS–MS analysis and ^{1}H-NMR were used to identify the main phytoconstituents in the *n*- butanol fraction of *T. nilotica* flowers. Using the SRB assay, the extract was examined *in vitro* for its cytotoxic effect against breast (MCF-7) and liver cell carcinoma (Huh-7) cancer cells.

Results: Based on the exact mass, the observed spectra fragmentation patterns, and literature data, LC-ESI-MS allowed the tentative identification of thirty-nine metabolites, varying between tannins, phenolic acids, and flavonoids. *T. nilotica n*-butanol fraction of the flower extract is rich in phenolic content. The classes of the compounds with a preliminary identification were confirmed by ^{1}H-NMR. The in-vitro analysis of the *n*-butanol fraction revealed modest activity on MCF-7, while the most promising impact was against liver cell carcinoma with an IC_{50} of 37 g/mL.

Conclusion: According to our research, *T. nilotica* flowers have potential phytoconstituents with a range of targets and signaling pathways, making them a potentially cytotoxic candidate against liver cell cancer.

Graphical Abstract



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Pharmaceutical Technology

Xylitol as a potential co-crystal coformer for enhanced dissolution rate of sofosbuvir

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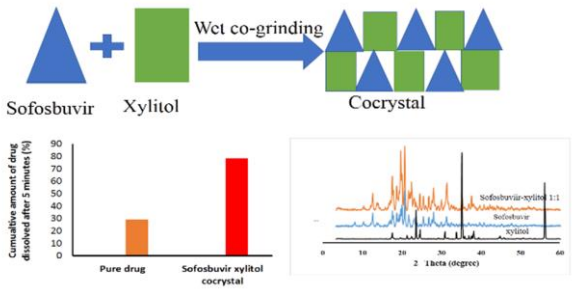
Abstract:

Sofosbuvir is one of the direct acting antiviral agents which is approved in the treatment of chronic HCV in combination with other agents. The low aqueous solubility of sofosbuvir resulted in slow dissolution which is supposed to be responsible for its low and variable bioavailability after oral administration. Accordingly, the objective of this work was to investigate the effect of co-crystallization of sofosbuvir with xylitol on its crystalline structure and dissolution rate. Mixtures of sofosbuvir with xylitol at various molar ratios were prepared by ethanol assisted kneading followed by drying. The dry products were then characterized by attenuated total reflectance Fourier transform infrared spectroscopy (ATR FTIR), differential scanning calorimetry (DSC), powder X-ray diffraction (XRD) and in vitro dissolution studies. Combined instrumental analysis reflected development of new crystalline species of co-crystal type. This was evidenced by the existence of hydrogen bonding as shown from FTIR spectra, change in the thermal behaviour and appearance of new diffraction peaks in the diffractograms recorded by XRD. The co-crystallization was associated by weakening of intermolecular bonds which resulted in significant increase in the dissolution rate of sofosbuvir. The study introduced xylitol as co-crystal co-formers for enhanced dissolution of sofosbuvir.

Keywords: Sofosbuvir co-crystals; Xylitol; Wet co-grinding method; Dissolution efficiency; Powder X-ray diffraction pattern

Graphical Abstract



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Biography:

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Subcellular Delivery of a Novel Honokiol-Loaded PEGylated PLGA Nanocapsules for Treatment of Breast Cancer.

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Abstract:

Honokiol (HK) is a common herbal medicine extracted from Magnolia plants. Low aqueous solubility and limited bioavailability of HK have hindered its clinical application especially for cancer treatment. Nano-drug delivery system has the potential to enhance HK delivery and therefore, enhance its anti-cancer activity. The study aim is to design novel PEGylated-PLGA polymeric nanocapsules (NCs) for honokiol delivery to breast tumor-bearing mice after systemic administration. Formulation of different HK-loaded NCs and their physio-chemical characterization were optimized through use of different formulation variables. The antitumor activity of the HK-loaded NCs was investigated both in vitro using MCF-7 and EAC breast cancer cell lines and in vivo using Solid Ehrlich Carcinoma (SEC) breast cancer model. The optimum HK-loaded NCs was prepared from 15%PEG-PLGA diblock copolymer and exhibited lowest nano size of 125 nm, smooth spherical morphology, highest drug loading of 94% and highest cellular uptake into breast cancer cells. HK-loaded PEGylated NCs can effectively inhibit the in vitro cell growth of breast cancer cells by 80.2% and 58.1% compared to 35% and 31% with free HK in case of MCF-7 and EAC, respectively. HK-loaded NCs inhibited SEC tumor growth by 2.3 fold significantly higher than free HK, in vivo. The designed drug delivery system encapsulating HK exhibited a pronounced decrease in tumor growth biomarkers meanwhile proved its safety in animals. Therefore, 15% PEGylated HK-loaded NCs may act as a promising new approach for breast cancer treatment.

Key words: Honokiol, nanocapsule, PEG-PLGA copolymers, formulation variables, anti-cancer activity, Solid Ehrlich Carcinoma, breast cancer.

Biography:

Dr. Yusuf Haggag is recently working as a Visiting Assistant Research Scientist of Pharmaceutical Sciences at the College of Pharmacy, University of Michigan, the USA from December 2021 till now.

Dr. Haggag worked for three years as a lecturer of Pharmaceutical Technology at, the Faculty of Pharmacy, Tanta University, Egypt

Dr. Haggag has published 28 journal publications with about 800 citations. He has an h index of 17

Design and characterization of tenoxicam microcapsules prepared by ionotropic gelation and in vivo evaluation of ulcerogenic activity in rats

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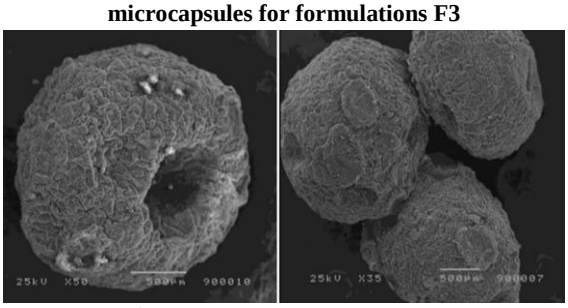
Abstract:

The formulation of tenoxicam using biodegradable and biocompatible polymers in the form of microcapsules is expected to decrease gastrointestinal side effects. Different microcapsule formulation of tenoxicam were prepared by ionotropic gelation technique using sodium alginate as a carrier and methyl cellulose as a release modifying agent. Microcapsules of tenoxicam prepared in this study were evaluated for flow properties, drug entrapment efficiency as well as drug release from various formulations. Controlled release microcapsules of tenoxicam were successfully prepared using Ionotropic Gelation Technique. No significant drug-polymer interactions were observed in infrared studies. The surface morphology of drug-loaded microcapsules prepared with sodium alginate and methyl cellulose was spherical in shape and has large bridges observed on the outer surface. Pathological study of sectional stomach specimen from all groups appeared to support in vitro results in the comparative evaluation of the role of methyl cellulose as a protective polymer in decreasing the gastric ulcer induced in rats by tenoxicam.

Scanning Electron Micrographs of tenoxicam microcapsules for formulations F3



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Biography

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Tailoring Dexamethasone Loaded BSA/PEI NPs: A Full Factorial Design Approach Enhanced Anti-inflammatory Activity

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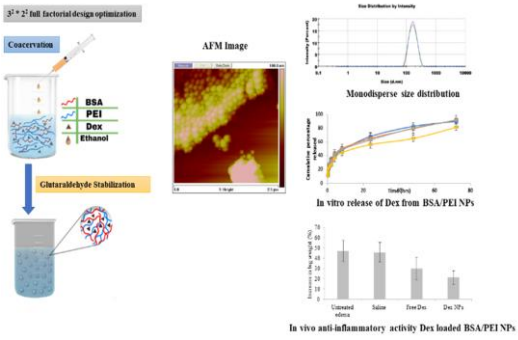
Abstract

Protein-based nanoparticles (NPs) are biodegradable, biocompatible, and easily amenable to chemical modifications to allow for the incorporation of bioactive compounds. In the current study, we adopted a full factorial design to optimize dexamethasone disodium phosphate (Dex) encapsulation within NPs formed with bovine serum albumin (BSA) and stabilized using polyethylenimine (PEI). The optimized NP size (<200 nm dia.), zeta potential (-23.3 mV), and entrapment efficiency (67.4%) were occurred at 0.652 mg, 0.04, 5%, and 8.3 for solution concentration of Dex, PEI/BSA molar ratio, BSA solution concentration, and solution pH, respectively. Incorporation of Dex resulted in a decrease in alpha helix content of BSA indicating a change in its secondary structure. Dex loaded NPs yielded a bimodal release of Dex over an extended period of time *via* a quasi-Fickian diffusion mechanism. The *in vivo* anti-inflammatory activity of BSA/PEI Dex NPs surpassed that of free Dex in carrageenan-induced hind paw edema in rats as evidenced by enhanced suppression of oxidative stress, abrogation of NF-κB-p65 expression, as well as reduced myositis and inflammatory cell infiltration. The extended-release profile of BSA/PEI Dex NPs is crucial for achieving a significantly significant anti-inflammatory activity

Graphical abstract



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[2] M. Jahanshahi, Z. Babaei, Protein nanoparticle: a unique system as drug delivery vehicles, African Journal of Biotechnology, 7 (2008).

Biography

Suleiman S. El Tokhy is a lecturer of Pharmaceutical Techonology, Faculty of Pharmacy, Tanta University. He was PhD Visiting Scholar at National institute for Nanotechnology (NINT), Alberta University (Canada). His research focuses development and characterization of different drug delivery systems. He has participated in several research projects, authoring or co-authoring several peer-reviewed manuscripts in the field of Pharmaceutics, Drug Delivery, Drug Targeting and Nanotechnology.

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A simple model to establish in vivo-in vitro correlation for etamsylate controlled release matrix tablets.

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Abstract:

Objective: The objective was to establish IVIVC for etamsylate CR tablets.

Methods: Tablets containing 500 mg etamsylate were formulated; immediate release (IR), and controlled release tablets with different dissolution rates; CRfast and CRslow. The in vitro dissolution of the CR tablets was performed using the buffer transition method at pH 1.2 for 2 hr, pH 6.8 for 3 hr, and pH 7.4 for 7 hr. Eight volunteers received the three products in cross-over experimental design. Etamsylate pharmacokinetic parameters were estimated. A model that utilized the in vitro dissolution data and the estimated pharmacokinetic parameters was developed to establish the IVIVC for the CR tablets.

Results: The dissolution rate of the two CR tablets was described by the Higuchi model with dissolution rates of 39.1%/hr0.5 and 30.4%/hr0.5 for the CRfast and CRslow, respectively. Etamsylate Cpmax were 7.52±2.1, 3.93±0.96, and 3.13±0.27 mg/L, and tmax were 5, 8, and 10 hr, and AUC were 80.2±13.73, 69.4±12.97, and 61.1 ±0.44 mg-hr/L for the IR, CRfast and CRslow, respectively. The IVIVC model predicted Cpmax were 4.31 and 3.13 mg/L while the mean experimentally determined Cpmax were 3.93 and 2.98 mg/L, whereas the model predicted AUC were 70.8 and 61.6 mg-hr/L and the mean experimentally determined AUC were 69.4 and 61.1 mg-hr/L for the CRfast and CRslow tablets, respectively. A plot of the percent absorbed in vivo starting at 2.0 hr versus percent of drug dissolved in vitro starting at time 0, showed very good point-to-point correlation with R2 equal to 0.98.

Conclusion: The IVIVC model-predicted and experimentally observed Cpmax and AUC for the two CR tablets were within the acceptable limit, indicating good model predictability. Also, the obtained results showed very good point-to-point correlation between the percent drug absorbed in vivo and the percent drug dissolved in vitro, again indicating validity of the model