

Editorial

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For the 2023 issue of *The Chemist* published by the American Institute of Chemists, we present a well-rounded variety of articles written by authors from all over the world. Following the theme of chemistry for an ever-changing world, we have articles from all diverse areas of chemistry from authors all over the world.

To begin, we first honor contributions from American Institute of Chemists Pioneer Awardees. We first honor Prof. Chi-Huey Wong from Scripps University in San Diego. Dr. Wong is a world-renowned expert in the fields of bioorganic and synthetic chemistry. His lab's current interests are centered on the development of discovery tools for understanding the role of biological glycosylation in cancer progression, bacterial and viral infection, neurodegenerative disorder and immune response.

In his review article "Recent Advances in Carbohydrate Chemistry and Application," Dr. Wong writes about cutting advances in carbohydrate chemistry. In this review, Prof. Wong highlights recent advances in carbohydrate chemistry and glycobiology. This work has created a better understanding of carbohydrates and the associated biological glycosylation. Prof. Wong describes new advances in carbohydrate synthesis and its application to the understanding of glycosylation in protein folding, cancer progression, influenza and SARS-CoV-2 infection and the development of carbohydrate-based medicines. Particular emphasis is also placed on cancer-cell specific glycans and further showing the importance of glycosylation from a wide variety of applications.

Moreover, our other Chemical Pioneer Award winner is Prof. Alison Butler from the Department of Chemistry at the University of California, Santa Barbara. Dr. Butler is a prolific scholar in the field of bioinorganic chemistry, metallobiochemistry and chemical biology, specifically with an emphasis on elucidating roles of metal ions in catalytic activities of metalloenzymes, and discovering molecules and processes by which microbes acquire the transition metals needed to grow. In her article "Marine Microbial Siderophores: Reactivity and Structural Diversity," Siderophores are discussed in detail, which are ligands with a high affinity for ferric ion and which facilitate transport of Fe(III) into and within bacteria that are isolated from open ocean isolates. This includes suites of amphiphilic siderophores that vary in the nature of the fatty acid appendages, photoreactive Fe(III)-siderophore complexes as a result of coordination to α -hydroxy carboxylic acid groups, and a new series of tris catechol siderophores.

In addition to the articles from the Chemical Pioneer Award winners, we have received several other contributions to the issue. In "Surface Chemistry and Biomolecule Density Impact Adsorbed Cellulase Activity," Vasicek et. al depict how functional group and biomolecule density on silica-coated iron oxide nanoparticles relate to the activity of adsorbed cellulases. The adsorption percent was related to greater functional group density, while the specific activity was inversely proportional to functional group density. The work has vast implications on the use of cellulosic ethanol production by immobilizing cellulases to ensure an abundance of cellulase is immobilized in an active conformation. Rheima et. al contributed "Eco-friendly Method of Synthesis CeO₂ Nanoparticles by Watercress Plant Extract for Removal of Cibacron Red Dye from Aqueous Solutions." In this

study, the authors discuss the environmentally friendly synthesis of CeO₂ nanoparticles using plant extract from watercress and calcination. They found that the observed adsorption properties are efficacious for removing dye from aqueous solutions.

In “Estimation of Nonlinear Regression Parameters Precision” Prasanth Sambaraju discusses the calculation of the parameter precision values in nonlinear regression using Microsoft Excel. Example calculations are performed on nonlinear datasets from NIST Statistical reference datasets, where the parameters are initially estimated by using Solver and then by using Finite differences method parameter precision values are calculated. Dr. Tah’s group performed another estimation study in their contribution “Estimation of Serum Tumor Markers and Some Biochemical Parameters of Breast Cancer Patients.” In this study, they determined the levels of certain tumor markers (CA15.3, CEA) and some biochemical parameters (calcium, vitamin D3, alkaline phosphatase, uric acid, creatinine, and urea) in breast cancer women with different stages. They found a significant increase in CEA and CA15.3 values in women with breast cancer as compared to the control group, which should have vast implications in both breast cancer diagnostics and potential treatments.

AL-Salman and colleagues contributed “Formulation and Sustained-Release of Verapamil Hydrochloride Tablets,” where they discussed the synthesis of Verapamil hydrochloride effervescent tablets through direct compression. The tablets were thoroughly characterized by in vitro testing such as stability, floating (buoyancy), water uptake, differential scanning calorimetry, Fourier-transfer infrared spectroscopy (FT-IR) and other related techniques, which gave important information on their properties.

Our issue concludes with a conversation by Emma Sagarese and poem submitted from Meyer R. Rosen FAIC, FRSC, CPC, CChE. This last contribution truly shows the versatility and presence of chemistry in all fields of knowledge and the intersection between science and art.

We hope that you enjoy this issue and consider submitting a manuscript for consideration and publication to The Chemist in the near future.

Best regards,

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