

Meet the editor: Dr. Mohammad Sharif Khan

**Mohammad Sharif Khan**

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Dr. Mohammad Sharif Khan was born in June 1988 in Dhaka, Bangladesh. After the completion of high school, he attended the University of Dhaka and earned his Bachelor of Science on Nutrition and Food Science. In 2012, he moved to Malaysia for the master's degree (by research) in Pharmaceutical chemistry. During this period, "Green and Sustainable Chemistry" and "Metabolomics" were introduced to him and he grew interested in analytical chemistry. Mohammad later joined Prof. Philip Marriott's lab at Monash University, Australia for PhD research in analytical chemistry.

During PhD, Mohammad worked with analytical method development and instrumentation on the metabolomics profiling/fingerprinting of very complex sample matrix such as plant materials and petrochemicals using chromatography and spectroscopy techniques like GCxGC, GC-QMS, GC-QQQ, GC-QTOF, HPLC-QTOF and UPLC-TOF. A few applications of the advanced chromatography and mass spectrometry techniques are the volatile and sensory analysis of herbs, spices, wine, coffee, essential oil and metabolomics analysis of traditional herbal materials or petrochemical, pesticides and pollutants.

Mohammad's PhD research developed pressure tuning GCxGC which is a new and innovative technique for analyt-

ical chemistry. The developed "Pressure-tuning" method improves the flexibility and selectivity of the comprehensive gas chromatography [1-3]. The issue in the GCxGC is; it works best when it has an optimized column set for a particular application. So every application requires a different set of the column set in GCxGC. Mohammad has developed a way to tune the contribution of each column on the couple-column set so it changes the overall separation performance. The result showed that without changing the stationary phases or on the other word, using the same set of column set we could get thousands of intermediate selectivity. It enables the same system to use for essential oil, petrochemicals, biological, small molecules and other applications.

Before that, Mohammad has developed a green, sustainable, environment-friendly sample preparation method for biologically important chemical substances. The method is developed, optimized and applied based on modified Supercritical Fluid (SF) method to extract biologically important chemical substances from complex matrices [4,5]. He has also developed an analytical method that consider the importance of synergetic of the multiple compounds on the biological activity and the proper way to measure this. He has proposed two different approaches based on the instruments those are available in the most of the analytical chemistry laboratory,

Thin-layer chromatography (TLC) and Fourier transform infra-red (FTIR) for analyzing these biological samples with minimum chemical uses by the proper experimental design and omics-based analysis method [6]. Mohammad's efforts in analytical chemistry research have developed a remarkable record of publication. He has written 20 journal publications and 9 more are under preparation for publication, an amount of articles that reflects his consistent contributions to scientific research. Mohammad's publications have garnered an exceptional 1970 citations by October 2020 according to google scholar.

Mohammad is currently applying the developed analytical and mass spectroscopy based omics methodologies to biomedical application. He has recently joined at Wake Forest Baptist Health (WFBH) at North Carolina. His research investigating lung distress biomarkers from radiation, ageing, smoking, environment and chemical warfare agents. Before he joined to WFBH, he was working at Dartmouth college. He had investigated volatiles from infectious disease microbiome and expand understanding of the host-microbes interaction mechanism for disease diagnosis, screening, staging, monitoring, surveillance, prediction or prognosis. He was involved with tuberculosis (TB) biomarkers discovery from pre-clinical non-human primate and humane participants. TB diagnosis is difficult because there is no universal TB diagnostic test that can provide the result within a day. In practical, the fastest TB test requires at least 3 days to confirm TB status. Analysis of breath samples and detection of TB biomarkers using GCxGC would enable a Point-of-Care (POC) breath test of TB diagnosis. Mohammad is aspirated to be a leading researcher on the field on bioanalytical chemistry, multi-omics technologies for the biological problem and the application of big data science on biomedical science.

Mohammad has worked with different collaborators and stakeholders to make some fruitful scientific collaborations already in his early career. He is an active member of the Royal Australian Chemical Institutes (RACI), American Chemical Society (ACS), and other organizations. He has collaborated with researchers from the USA, Italy, Japan, Thailand, Brazil, Malaysia, and Bangladesh. In 2018, Mohammad's work was selected as "Outstanding research work by Australian Researchers" from ACS publication, highlighted on "LC-GC magazine" (2018) and nominated as the best work in the Capillary Chromatography conferences at Riva, Italy (2016). Recently, (2019), he was selected as a "Young Lead-

er" at International Association of Breath Research (IABR). To date, he has reviewed 39 papers for publication across nine different academic journals. He is serving multiple editorial role for Frontier of Chemistry, Journal of Applied Bioanalysis and Current Chromatography. Apart from research, Mohammad love to watch cricket match, play football, blog, take photographs, and travel.

Selected Publications

1. Sharif KM, Marriott PJ. Pressure tuning: Increasing the flexibility of comprehensive two-dimensional gas chromatography. *LCGC Europe* 31(8), 422–426 (2018).
2. Sharif KM, Kulsing C, Marriott PJ. Pressure tuning of first dimension columns in comprehensive two-dimensional gas chromatography. *Anal Chem* 88, 9087-9094 (2016).
3. Sharif KM, Kulsing C, Chin ST, Marriott PJ. Relating pressure tuned coupled column ensembles with the solvation parameter model for tunable selectivity in gas chromatography. *J Chrom A* 1455, 156-162 (2016).
4. Sharif KM, Rahman MM, Azmir J, Hadijah S, Selim MU, Fahim TK, Zaidul IS. Ethanol modified supercritical carbon dioxide extraction of antioxidant rich compounds from *Pereskia bleo*. *J Ind Eng Chem* 21, 1314-1322 (2014).
5. Azmir J, Zaidul IS, Rahman MM, Sharif KM, Mohamed A, Sahena F, Jahurul MH, Ghafoor K, Norulaini NA, Omar AK. Techniques for extraction of bioactive compounds from plant materials. *J Food Eng* 117(4), 426–436 (2013).
6. Sharif KM, Rahman MM, Azmir J, Khatib A, Hadijah S, Zaidul IS. Multivariate analysis of PRISMA optimized TLC image for predicting antioxidant activity and identification of contributing compounds from *Pereskia bleo*. *Biomed Chrom* 29(12), 1826-33 (2015).