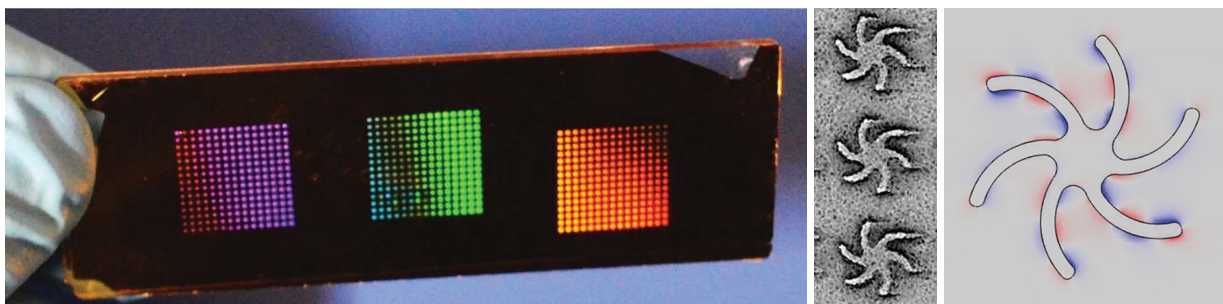


# Chiral Plasmonic Assays

*light/nano-surface interactions to sense molecular configurations*

GUBiosense Zoom Seminar – Tuesday 5<sup>th</sup> May 4-5pm (UK Time)

<https://uofglasgow.zoom.us/j/98734227015>



Dr. Karimullah is currently an EPSRC Innovation Fellow working on applications of plasmonics. He received his bachelors in engineering from National University of Science and Technology Pakistan (2007) and completed his MSc. in electrical and electronics (2008) from University of Glasgow. He completed his Ph.D. in biomedical engineering as a GRPE scholar from Glasgow as well. Since then he has been a staff member in the Chemical Photonics section at the School of Chemistry. His research interest dwell around the use of metamaterials for various sensing applications. One of these is to use chiral plasmonic metafilms for biostructure sensitive sensors. They also explore the use of unique material such as metal organic frameworks and organic fluorescent complexes with plasmonic systems to create hybrid technologies.

## Abstract

The structure of a protein is an important property that determines its functionality. It dictates how the proteins interact with other molecules, which is significantly important in medical diagnostics and drug discovery. Determining the changes to protein structure can be used for determining protein-protein or protein-small molecule interaction events. However, determining the structure of a protein requires detailed, tedious and expensive techniques such as x-ray crystallography. Optical spectroscopy techniques are not sensitive to the entire structure of a protein and all these methods require large sample quantities, eliminating their use for rapid routine diagnostics. Chiral Plasmonic Sensing (CPS) exploits a new class of label-free biostructure sensitive tests (assays) for diagnostics based on the interaction of asymmetrical metamaterials with proteins. They can be used to create a new form of structurally sensitive technology that we call "Chiral Plasmonic Assays" (CPAs) which will enable applications such as detection of multiple pathogens and improve drug discovery techniques. Our work looks at exploring the intrinsic properties of chiral plasmonics to optimise and engineer chiral nanostructures and the instrumentation in order to make this scientific discovery into a real life technological impact. In this presentation I will discuss the background discovery of chiral plasmonics, advances in our understanding of the biophysical interactions and development of the technology.