



Infectious  
Diseases Labs

ID LABS

# ID LABS SEMINAR SERIES



## Prof Matthew I. Gibson

Chemistry and Warwick Medical School

Royal Society Industry Fellow



Friday, 5<sup>th</sup> November 2021  
4pm to 5pm (SGT)

Join zoom meeting [here](#)  
Meeting ID: 995 1882 3747  
Passcode: 003999



Webinar is open to all  
No registration required

### Exploring Glycan Binding in Infection using Glyco-Nanoparticles. Dissecting Interactions and Developing Glyco-Diagnostics

Our cells are coated in a complex, dynamic, forest of glycans termed the glycocalyx, which plays a key role in cell-cell recognition and is a site for pathogen adhesion. The multivalent, and precise 3-D, presentation of glycans is crucial to drive both affinity and selectivity. Considering this, we have a research program investigating glyco-materials which can mimic the glycocalyx (and glycoproteins). The presentation of glycans onto gold nanoparticles is of particular interest, due to the unique optical properties of gold, which allow colourmetric sensing of lectin binding<sup>4</sup> (readable 'by eye'). Furthermore, gold nanoparticles are the 'signal generators' in lateral flow, point-of-care diagnostics producing the red line. Current LFDs use antibodies as the recognition unit, but we are exploring, with our partners, the use of glycopolymers as alternatives.

Here I will discuss our synthetic principles to tether glycosylated polymers onto gold nanoparticles surfaces, to introduce not just multivalency, but also colloidal stability in complex media. We have used this to prototype rapid diagnostics of COVID-19 infection, demonstrated with primary samples.

**Prof Matt** holds a personal chair (Full Professor) in the Department of Chemistry and also the Medical School at the University of Warwick, UK. Professor Gibson's multidisciplinary research group focusses on developing biomaterials to address healthcare challenges; new diagnostics/biosensors, including low cost disposal sensors; tools for dissecting infection glycobiology; development of macromolecular (polymer) cryoprotectants to enable the transport and storage of biologics (proteins/cells). In recognition of his research Matt has been prizes including the 2021 McBain Medal, 2018 ACS Biomacromolecules/Macromolecules Young investigator Award, as well as young investigator medals from the RSC Carbohydrate Group and MacroGroup UK. Matt is a Royal Society Industrial Research Fellow and has established the biotechnology start-up Cryologyx. Matt currently holds an ERC consolidator grant, and has published >150 publications and filed several patents.