

# Materials Science and Materials Chemistry

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## Owen J Guy

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### Development of graphene sensing platforms for real time diagnostics

Graphene is a 2D material with unique electrical and mechanical properties. Graphene devices and sensors promise to be a disruptive technology in next generation electronics and sensors - due to graphene's exceptional electronic properties and aptitude for chemical modification. Novel graphene sensor technology used to develop sensors, based on chemically functionalised graphene microchannels, and their application in lab-on-chip POC (Point-of-Care) diagnostics will be presented. There are several advantages of graphene sensors over alternative sensor platforms such as carbon nanotubes (CNTs) or silicon nanowires (SiNWs). The main benefits of graphene for sensing applications will be highlighted in a comparison with other materials. Real time sensing using graphene Field Effect Transistors (FETs) will be

presented. Important considerations for processing of samples using microfluidics and lab-on-chip technology will also be discussed, including developments in integration of diagnostics with therapeutics, "theranostics".

#### Speaker Biography

Owen J Guy, is the Head of Chemistry and Director of the Centre for Nanohealth (CNH) at Swansea University. CNH is a unique facility applying device fabrication & semiconductor processing to healthcare problems in collaboration with industry. His group has 15 years' experience in device fabrication (silicon, graphene & MEMS technology). He has developed graphene and microfluidics technology through EPSRC, Innovate UK and Marie Curie projects at Swansea, with a current £1M Newton fund project developing sensors for hepatitis. He has more than £17 million grant funding since 2012 and has published 60 papers and holds 2 granted patents.

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