

# ***Supramolecular chemistry of chemical warfare agents: from fundamental understanding to hazard mitigation***

**M. R. Sambrook**

CBR Division, Dstl, Porton Down, Salisbury, SP4 0JQ, UK

[msambrook@dstl.gov.uk](mailto:msambrook@dstl.gov.uk)

A comprehensive understanding of the fundamental non-covalent chemistry of Chemical Warfare Agents (CWAs) is critical to the future exploitation of supramolecular approaches to CWA hazard mitigation, including sensing, detection, decontamination, protection, and so forth. This understanding must also be accompanied by development of supramolecular CWA-simulant (non-/low-toxicity analogues) correlations, thus enabling academic and industrial research groups to further pursue novel research in this area.

Recently we have examined aspects of the recognition behaviour of G- and V-series CWAs, with an outline strategy shown in figure 1.<sup>1</sup>

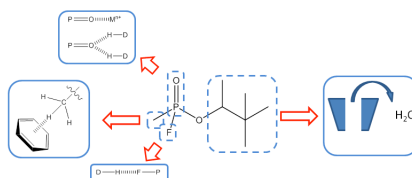


Figure 1. Potential sites for non-covalent interactions in the CWA GD (soman)

In this presentation research outputs relating to the fundamental recognition of CWAs will be discussed, with a focus on hydrogen bonding,<sup>2</sup> metal coordination<sup>3</sup> and hydrophobic inclusion. Highlights of research on the development of CWA-responsive systems will also be given, including work on nanoparticle-based sensors<sup>4</sup> and responsive supramolecular gels.<sup>5</sup>

- 1 M. R. Sambrook, S. Notman, *Chem. Soc. Rev.* **2013**, *42*, 9251-9267.
- 2 M. R. Sambrook *et al.*, *Chem. Commun.*, **2012**, *48*, 5605-5607.
- 3 G. H. Dennison *et al.*, *RSC Advances*, **2014**, *4*, 55524 – 55528.
- 4 R. C. Knighton *et al.*, **2013**, *49*, 2293-2295.
- 5 J. R. Hiscock *et al.*, *Chem. Sci.* **2015**, *6*, 5680-5684