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The systems chemistry of life-like objects

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In this short talk, I discuss the use of artificial cell-like entities (protocells) for the embodiment of systems chemistry. Examples of digital and analogue chemical systems are presented including; (i) DNA-based signal processing in protocell network arrays,¹ and (ii) enzyme-mediated interactivity and feedback in dispersed protocell communities.^{2,3} These new model systems highlight possibilities for programmable routes towards basic signalling/sensing pathways and distributed computation in compartmentalized microscale objects.

References:

- [1] Joesaar A, et al; *DNA-based communication in populations of synthetic protocells*. *Nature Nanotechnology* **14**, 369-378 (2019).
- [2] Qiao Y, Li M, Booth R and Mann S. *Predatory behaviour in synthetic protocell communities*. *Nature Chemistry* **9**, 110–119 (2017).
- [3] Qiao Y, Li M, Qiu D and Mann S. *Response-retaliation behaviour in synthetic protocell communities*. *Angew. Chem. Int. Ed.* **58**, 17758-17763 (2019).