

The Department of Chemistry Weekly Seminar

**Monday 22/11/21, 12:00pm (refreshments
11:45am)**

Emergence of Function in Synthetic Networks Out of Equilibrium

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Systems Chemistry aims to develop complex molecular networks featuring emergent properties; i.e., properties that go beyond the sum of the characteristics of the molecular constituents of the system. [1,2] For almost two decades, our group has focused on the development of such systems using peptide-based replication networks. Two of the current challenges related to the emergence of functions in complex systems will be discussed: (i) 'selection' of the best replicators in networks of peptides [3] and nucleic acid peptide chimeras [4], and (ii) design and analysis of networks operating away from chemical equilibrium, presenting dynamic features such as bistability and oscillations.[5,6] Future directions such as the search into the function of coupled networks will also be discussed shortly.

1. Ashkenasy, Hermans, Otto, Taylor "Systems Chemistry" Chem. Soc. Rev. 2017.
2. Bai, Chotera, Taran, Liang, Ashkenasy, Lynn "Achieving biopolymer synergy in systems chemistry" Chem. Soc. Rev. 2018.
3. Nanda et al. Nature Commun. 2017.
4. Bandela et al. PNAS 2021.
5. Maity et al. Nature Commun. 2019.
6. Maity et al. Angew. Chem. Int. Ed. 2021.

Looking forward to seeing you!