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# Prof. Lee Cronin



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**Lee Cronin** is the Gardiner Chair of Chemistry at the University of Glasgow. Cronin is recognized for his creative studies in the field of inorganic chemistry, specifically the self-assembly and self-organization of inorganic molecules and the engineering of complex systems leading to the emergence of system-level behaviours. Cronin has published over 240 papers that have amassed >6000 citations in the world's leading scientific journals and has given over 180 invited talks.

He has over 40 national and international collaborators and has active research exchanges with Beijing University of Chemical Technology, Arizona State, Emory, Hokkaido University, Tokyo University, University of Aachen, North East Normal University, and Northwestern as well as numerous companies in the UK and around the world. In 2009 Cronin was elected to Fellowship of the Royal Society of Edinburgh and between 2006 and 2011 he was an EPSRC Advanced Research Fellow.

## Research Interests

The focus of Cronin's work is understanding and controlling self-assembly and self-organisation in Chemistry to develop functional molecular and nano-molecular chemical systems; linking architectural design with function and recently engineering system-level functions (e.g. coupled catalytic self-assembly, emergence of inorganic materials and fabrication of inorganic cells that allow complex cooperative behaviours). As well as investigating new technological applications of metal oxides, Cronin is developing several new 'reaction-formats' for chemical reactions as well as applications in catalysis, energy, and coatings. These include flow reactors for evolvable chemistry and 3D-printing 'wetfab' for the democratisation of chemistry e.g. synthesis of drugs important for the developing world and counterfeit drug sensors.

## Representative Publications

H. N. Miras, G. J. T. Cooper, D.-L. Long, H. Bögge, A. Müller, C. Streb and L. Cronin, 'Unveiling the Transient Template in the Self Assembly of a Molecular Oxide Nano-Wheel', *Science*, 2010, 327, 72-74. [Cover article]

C. Ritchie, G. J. T. Cooper, Y.-F. Song, C. Streb, H. Yin, A. D. C. Parenty, D. A. MacLaren, and L. Cronin 'Spontaneous Assembly and Real-Time Growth of Micron-Scale Tubular Structures from Polyoxometalate-Based Inorganic Solids' *Nature Chemistry*, 2009, 1, 47-52. [Cover article]

G. J. T. Cooper, P. J. Kitson, R. Winter, M. Zagnoni, D.-L. Long and L. Cronin 'Modular Redox Active Inorganic Chemical Cells: iCHELLs', *Angew. Chem. Int. Ed.*, 2011, 50, 10373-10376. [Cover article]

H. N. Miras, M. Sorus, J. Hawckett, D. O. Sells, E. J. L. McInnes, L. Cronin, 'Oscillatory Template Exchange in Polyoxometalate Capsules: A Ligand-Triggered, Redox-Powered, Chemically Damped Oscillation', *J. Am. Chem. Soc.*, 2012, 134, 6980-6983.

M. D. Symes, P. J. Kitson, J. Yan, C. J. Richmond, G. J. T. Cooper, R. W. Bowman, T. Vilbrandt, L. Cronin, 'Integrated 3D-printed reactionware for chemical synthesis and analysis', *Nature Chemistry*, 2012, 4, 349-354. [Cover article]

P. Kitson, M. Rosnes, V. Sans, V. Dragone, L. Cronin, 'Configurable 3D-Printed millifluidic and microfluidic 'lab on a chip' reactionware devices', *Lab on a chip*, 2012, 12, 3267-71. [Cover article]

D. -L. Long, R. Tsunashima, L. Cronin, 'Polyoxometalates: Building Blocks for Functional Nanoscale Systems', *Angew. Chem. Int. Ed.*, 2010, 49, 1736-1758.

C. P. Pradeep, D.-L. Long, G. N. Newton, Y.-F. Song, and L. Cronin, 'Supramolecular Metal Oxides: Programmed Hierarchical Assembly of a Protein-Sized 21 kD  $\{(TBA)_{19}[H_2NC(CH_2O)_3 P_2V_3W_{15}O_{59}]_4\}_5$  - Polyoxometalate Assembly', *Angew. Chem. Int. Ed.*, 2008, 47, 4388-4391.