Macromolecules Innovation Institute (MII) Seminar Series

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Prof. Wenbin Lin

"Metal-organic Frameworks for Sustainable Catalysis and Cancer Therapy"

University of Chicago
Department of Chemistry

Host: Amanda Morris

Abstract: Metal-organic frameworks (MOFs) represent an interesting class of crystalline molecular materials that are synthesized by combining metal-connecting points and bridging ligands. The modular nature of and mild conditions for MOF synthesis have permitted the rational structural design of numerous MOFs and the incorporation of various functionalities via constituent building blocks. The structure-property relationships of MOFs can also be readily established by taking advantage of the knowledge of their detailed atomic structures, which enables fine-tuning of their functionalities for desired applications. In this talk, I will discuss our recent works on designing MOFs for sustainable catalysis and cancer therapy. MOFs have enabled the rational synthesis of single-site solid catalysts by not only facilitating the immobilization of known homogeneous catalysts but also allowing the discovery of new molecular catalysts that do not have homogeneous counterparts. Furthermore, we have demonstrated the ability to combine multiple treatment modalities into a single MOF nanoparticle for effective cancer therapy in mouse models.

Bio: Dr. Wenbin Lin is the James Franck Professor of Chemistry and a member of the Comprehensive Cancer Center at the University of Chicago. He has also served as the Kenan Distinguished Professor of Chemistry at the University of North Carolina at Chapel Hill, where he held joint appointments in the UNC-CH School of Pharmacy and the Lineberger Comprehensive Cancer Center. Lin obtained his BS from the University of Science and Technology in Hefei, China and his PhD at the University of Illinois at Urbana-Champaign.

University of Chicago, Department of Chemistry
5801 S Ellis Ave., Chicago, IL 60637
Office: GCIS E519A
Phone: (773) 834-7163
E-mail: wenbinlin@uchicago.edu
Website: http://linlab.uchicago.edu/

He was an NSF postdoctoral fellow at Northwestern University before joining Brandeis University as an assistant professor of chemistry in 1997. Lin focuses on designing molecular materials for sustainability and human health. He and his group have explored how these materials can be applied to a wide range of present-day concerns, including nonlinear optics, catalysis, uranium sequestration, solar energy, and nanomedicine. The Lin group has published over 280 peer-reviewed articles. He has been among the most cited chemists several years in a row and was selected to be one of the top 10 chemists in the 1999-2009 decade based on per article citations. Dr. Lin has received numerous professional honors for his contributions to the rational design of functional molecular materials

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