

CiQUS Lecture

Self-assembly of Peptide-based
Nanomaterials: Structural Insights into
the Self-Assembly of Helical Peptide
Filaments and Tubes

Prof. Vincent P. Conticello



Department of Chemistry, Emory University Atlanta, EEUU

More info: Research Group website

**Wednesday, July 6, 2022**
12:15 p.m. CiQUS Seminar RoomFONDO EUROPEO DE DESENVOLVEMENTO REXIONAL
PO FEDER Galicia 2014-2020 – *Unha maneira de facer Europa*Link to group website: <https://conticello.emorychem.science>**Abstract:**

Structurally defined materials on the nanometer length-scale have been historically the most challenging to rationally construct and the most difficult to structurally analyze. Sequence-specific biomolecules, i.e., peptides and nucleic acids, have advantages as design elements for construction of these types of nano-scale materials in that correlations can be drawn between sequence and higher order structure, potentially affording ordered assemblies in which functional properties can be controlled through the progression of structural hierarchy encoded at the molecular level. However, the predictable design of self-assembled structures requires precise structural control of the interfaces between peptide subunits (protomers). In contrast to the robustness of protein tertiary structure, quaternary structure has been postulated to be labile with respect to mutagenesis of residues located at the protein-protein interface. In addition, self-assembling peptide systems have been shown to be exquisitely sensitive to preparative conditions. We have employed simple self-assembling peptide systems to interrogate the concept of designability of interfaces within the structural context of filaments and nanotubes. These peptide systems provide a framework for understanding how minor sequence changes in evolution or preparative conditions can translate into very large changes in supramolecular structure, which provides significant evidence that the designability of protein interfaces is a critical consideration for control of supramolecular structure in self-assembling systems.

Biosketch:

Professor Vincent Conticello is a materials chemist that leads a research group that focuses on the design and structural analysis of peptide and protein assemblies. Vincent was born in Wilmington, Delaware in the U.S.A. and graduated with a B.S. in Chemistry from the University of Delaware (1985). He completed his

Ph.D. degree (1990) as a National Science Foundation Pre-doctoral Fellow in Chemistry at Northwestern University under the direction of Prof. Tobin Marks. After performing postdoctoral research in Chemistry at Caltech under Professor Robert Grubbs and Polymer Science at the University of Massachusetts under Professor David Tirrell, Vincent joined the Department of Chemistry at Emory University (1995) as an assistant professor and is currently Professor of Chemistry and Co-Scientific Director of the Electron Microscopy Core Facility.