**Designing Peptides to Gain Insights Into Protein Structure and Function**

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In principle, the structure of a protein could be divided into peptide modules and the conformational properties of these "structural elements" can be studied to derive insights into protein structure and function. In this lecture, I will discuss three examples to illustrate this strategy: (i) the design of "caged" peptides of structural elements to study the early kinetic events in protein folding; (ii) the use of peptides to understand the instability of proteins and the molecular basis of amyloid fibril formation in proteinaeous diseases; and (iii) the construction of a tricopper-peptide complex that has led to the design of the first molecular catalyst for the efficient conversion of methane to methanol under ambient conditions.