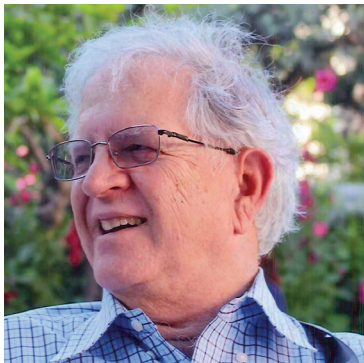


Center for the Study of Biological Complexity and Computer Science Department present **WORKSHOP on Intrinsically Disordered Proteins (IDPs)**

led by one of the pioneers in the field
Keith Dunker, Indiana University

February 21 @ 12:30 – 2:30 PM
Room 2137 Grace E. Harris Hall

**pizza and
drinks
provided**



Intrinsically disordered proteins and regions (**IDPs** and **IDRs**) lack well-defined tertiary structures, yet carry out various important cellular functions. They play absolutely key roles in cell signaling, cellular differentiation, translation, transcription and intracellular phase transitions (e.g. formation of membraneless organelles), to name just a few examples. Studies that critically depend on IDPs have received high recognition, including gene regulation (1965 Nobel Prize, Physiology and Medicine), autophagy (2016 Nobel prize, Physiology and Medicine), circadian rhythms (2017 Nobel Prize, Physiology and Medicine), and phage display (2018 Nobel Prize, Chemistry), yet research community and even the Nobel Laurates are (or were) not aware of the pivotal roles played by IDPs and

IDRs in the molecular mechanisms that underlie these phenomena. This stems from the virtually complete lack of coverage of IDPs and IDRs and their roles in various biological functions in current molecular biology, cell biology, biochemistry, chemical biology and structural biology curricula. This workshop focuses on providing answers to the following questions:

1. Why don't **IDPs and IDRs** fold on their own?
2. How common are **IDPs and IDRs**?
3. What are the functions of **IDPs and IDRs**?
4. What were the roles of **IDPs and IDRs** in molecular evolution?

The event will conclude with Q&A session with Dr. Dunker. Dr. Dunker will also deliver a research seminar “Intrinsically Disordered Proteins, Alternative Splicing, and Post-translational Modification (IDP-AS-PTM): A Toolkit for Developmental Biology” on Friday, Feb 22 at 12:00 – 1:00pm in Engineering West Hall 105.

In the 1980s to 1990s while at WSU Dr. Dunker was drawn to recognize the existence and importance of IDPs through three encounters with functional IDPs (Uversky's “Rule of Three”), especially Chuck Kissinger's November 15, 1995, Seminar on calcineurin (CaN). CaN is a serine-threonine phosphatase that contains a large **auto-inhibitory IDR** that shuts-off its own phosphatase activity in a manner that is reversed by calcium-calmodulin binding. This **IDR** is thus a calcium-dependent on-off switch for the phosphatase activity that connects calcium-based signaling with phosphate-based signaling, two of the most important signaling systems in eukaryotic cells. The truly spectacular functional importance of CaN's **IDR** led Dr. Dunker to immediately switch his research focus, with the aid of Chuck Kissinger and computer scientist Zoran Obradovic and his student Pedro Romero, to computational studies on **IDPs and IDRs**. From this start in late 1995 until now, Dunker and co-workers have published over 300 papers on these topics, see

<https://scholar.google.com/citations?user=4agt6FcAAAAJ>

