

Guest lecture

"How do intrinsically disordered protein regions contribute to increased functional versatility and cellular complexity?"

13 December 2016

1 PM in BMB seminar room

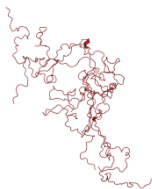


M. Madan Babu, PhD

Programme Leader, MRC Lab of Molecular Biology
Cambridge, UK

Abstract:

Figur 1 Disordered protein



In 1973, Christian Anfinsen postulated that the unique three-dimensional structure of a protein is determined by its amino acid sequence. This work laid the foundation for the sequence-structure-function paradigm, i.e. the sequence of a protein determines its structure, and structure determines function. However, a class of polypeptide segments called Intrinsically Disordered Regions (IDRs) defies this postulate [1-4]. In this lecture, I will first review how disordered regions contribute to protein function. I will then discuss how different regulatory mechanisms such as alternative splicing and asymmetric mRNA localization can increase the functional versatility of proteins containing disordered regions [4-10]. Finally, I will discuss the implications of our observations for human disease and the emergence of complexity in cellular systems.

1. Babu MM et al. *Science*. 2012. 337:1460-1.
2. van der Lee R et al. *Chem Rev*. 2014. 114:6589.
3. Tompa P et al. *Mol Cell*. 2014, 55:161-9.
4. Buljan M et al. *Mol Cell*. 2012. 46:871.
5. Buljan M et al. *Curr Opin Struct Biol*. 2013. 23:443.
6. Weatheritt R et al. *Nat Str Mol Biol*. 2014, 21:833-9.
7. Gsponer J et al. *Science*. 2008. 322:1365.
8. Babu MM et al. *Curr Opin Struct Biol*. 2011. 21:432.
9. Gsponer J and Babu MM. *Cell Rep*. 2012. 2:1425.
10. van der Lee R et al. *Cell Rep*. 2014. 8:1832-44.