



DIPARTIMENTO DI FARMACIA E BIOTECNOLOGIE

## Life & Chemical Sciences Seminars

# How order and disorder orchestrate the molecular ballet of transcription and replication in paramyxoviruses

**Dr. Sonia Longhi**

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**Venerdì 1 giugno ore 14:30** – Aula 1, Via Belmeloro 6  
(ospite Dr. B. Zambelli)

### **Abstract**

In the course of the structural characterization of the nucleoproteins (N) and phosphoproteins (P) from three paramyxoviruses (e.g. measles, Nipah and Hendra virus) we discovered that they contain long disordered regions. The N and P proteins from these viruses thus provide an excellent model system to study the functional impact of disordered motifs. The non-segmented, single-stranded RNA genome of these paramyxoviruses is encapsidated by the nucleoprotein (N) within a helical nucleocapsid. Transcription and replication are carried out onto this ribonucleoprotein complex by the viral RNA dependent RNA polymerase that consists of a complex between the large protein (L) and the phosphoprotein (P). The P protein serves as an essential polymerase co-factor as it allows recruitment of L onto the nucleocapsid template. Tethering of L relies on the interaction between the C-terminal X domain (PXD) of the P protein and the C-terminal, intrinsically disordered domain (NTAIL) of N. In my talk, I will focus on the mechanistic and functional aspects of the interactions established by NTAIL and will highlight the functional implications of disorder for viral transcription and replication.

### **Biosketch**

Dr. SONIA LONGHI (53-years old) is Director of Research (DR1) at the Center for the National Scientific Research (CNRS). Since 2005, she is the head of the "Structural Disorder and Molecular Recognition" group within the laboratory Architecture et Fonction des Macromolécules Biologiques (AFMB). She obtained a PhD in molecular biology from the University of Milan in 1993. She got a HDR in structural virology from the University of Aix-Marseille I in 2003. Her scientific focus is on intrinsically disordered proteins (IDPs) and the mechanistic and functional aspects of the interactions they establish with partners. Since 2005, she has been PI or co-PI of various national (ANR) and international (NIH) grants. She has authored 120 scientific publications in international peer review journals (h index= 40), edited a book on measles virus nucleoprotein and co-edited with Prof. Vladimir Uversky a book entitled "Instrumental analysis of intrinsically disordered proteins" and one entitled "Flexible viruses - Structural disorder in viral proteins".

*Commissione Ricerca e Attività Correlate*

Request PDF | How order and disorder within paramyxoviral nucleoproteins and phosphoproteins orchestrate the molecular interplay of transcription and replication | In this review, we summarize computational and experimental data gathered so far showing that structural disorder is abundant within paramyxoviral | Find, read and cite all the research you need on ResearchGate.Â Order and Disorder in the Replicative Complex of Paramyxoviruses. Article. Sep 2015. How order and disorder within paramyxoviral nucleoproteins and phosphoproteins orchestrate the molecular interplay of transcription and replication. Longhi S1,2, Bloyet LM3,4,5,6,7, Gianni S8, Gerlier D3,4,5,6,7. Author information.Â The molecular mechanisms that control the disorder-to-order transition undergone by the intrinsically disordered C-terminal domain (NTAIL) of their N proteins upon binding to the C-terminal X domain (XD) of the homologous P proteins are described in detail.Â Antiviral approaches; Fuzzy complexes; Induced folding; Intrinsic structural disorder; Nucleoprotein; Paramyxoviruses; Phosphoprotein; Proteinâ€“protein interactions. PMID: 28600653.