



Seminario



G. ANDERLUH

gregor.anderluh@ki.si

Department for Molecular Biology and Nanobiotechnology
National Institute of Chemistry, Ljubljana (SLO)

Structural basis for Nep1-like protein – plant membrane interactions

Necrosis and ethylene-inducing peptide 1 (Nep1)-like proteins (NLPs) are virulence factors that are secreted by several plant pathogens and can be found in bacteria, fungi and oomycetes. They trigger plant tissue necrosis and immunity-associated responses in various dicotyledonous plants. The molecular details of their cytolytic mechanism are not known in a great detail. We have identified glycosyl inositol phospho ceramides (GIPC), plant-related sphingolipids, as a target molecule for NLP binding to plant membranes. Glucosamine is often present as the terminal sugar in the GIPC structure. Surface plasmon resonance showed that it can bind to toxic NLP protein by millimolar affinity. We also solved several crystal structures of toxic and non-toxic members of NLP protein family and provided details into the lipid headgroup binding. Structural analysis allowed us to determine the residues that participate in binding the sugar headgroup and to elucidate the importance of the metal ion coordination due to its linkage to carbohydrate moiety through a network of hydrogen bonds. Collectively, we have provided important molecular insights into the novel mechanism of cytolytic activity of toxic NLP proteins towards plant membranes.

Prof. dr. Gregor Anderluh has obtained his PhD from the University of Ljubljana. He is a full professor at the University of Ljubljana. He was a head of the Department of Biology, University of Ljubljana and the Laboratory for Molecular Biology and Nanobiotechnology at the National Institute of Chemistry. Since 2015 he is the director of the National Institute of Chemistry. He is studying interactions of proteins with cellular membranes in bacterial pathogenesis, plant-pathogen interactions and human immune system. He is associated member of the Slovenian Academy of Sciences and Arts and member of Academia Europaea.

Room 6302 – Palazzo della ricerca e della conoscenza
February 14, 2018 – 10:30 a.m.



FONDAZIONE
EDMUND
MACH 