ESRF	**Experiment title:** Zinc induced oligomerization of the intrinsically disordered histatin 5 by dynamic ion coordination	**Experiment number:** **MX-2128**
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Abstract:
Intrinsically disordered proteins (IDPs) can form functional oligomers and in some cases, insoluble disease related aggregates. It is therefore vital to understand processes and mechanisms that control pathway distribution. Divalent cations including Zn^{2+} can initiate IDP oligomerisation through the interaction with histidine residues but the mechanisms of doing so are far from understood. Here we apply a multi-disciplinary approach using small angle X-ray scattering, nuclear magnetic resonance spectroscopy, calorimetry and computations to show that that saliva protein Histatin 5 forms highly dynamic oligomers in the presence of Zn^{2+}. The process is critically dependent upon interaction between Zn^{2+} ions and distinct histidine rich binding motifs which allows for thermodynamic switching between states. We propose a molecular mechanism of oligomerisation, which may be generally applicable to other histidine rich IDPs. Finally, as Histatin 5 is an important saliva component, we suggest that Zn^{2+} induced oligomerisation may be crucial for maintaining saliva homeostasis.