Trefoil knots are the most frequently observed knotted topology in proteins. It is speculated that knotted topologies play important roles in protein function by enhancing their catalytic activity, ligand-binding affinity, and increasing their macromolecular thermodynamic, kinetic, and mechanical stability. Co-ordination driven self-assembly has been established as a nice protocol towards the synthesis of complex architectures including molecular knots. However reports on the practical application and utility of such molecular knots remain very limited. In my talk I will be discussing the preparation of different metal-based trefoil knots and their use in three new applications: (i) catalysis, (ii) protein-protein interactions inhibition, and (iii) cancer therapy.


Figure 1. Single crystal structure of a metal-organic knot and the applications used for.