Macrocycle-mediated Protein Assembly

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Although desirable for fabricating biocompatible materials, controlled protein assembly is mostly a challenging, case-by-case endeavour. The challenge arises from the chemical and geometric complexity of protein surfaces. Different strategies are in development to overcome this challenge.[1] For example, water soluble macrocycles are proving to be useful assembly mediators.[1-4] Symmetric and chemically-uniform, the macrocycle can mask the protein, simplifying the surface features and providing a glue for assembly. Recent work with sulfonato-calix[8]arene (**sclx$_8$**) will be illustrated.

RSL, a 6-bladed β-propeller lectin, yields at least five types of co-crystal framework with **sclx$_8$**. In some of these structures the calixarene occurs as dimers or trimers that mediate the crystal packing (Figure 1). The staggered arrangement of the calixarene is similar to that in a sodium – **sclx$_8$** salt crystal, suggesting that supramolecular synthons can direct protein assembly.[3] Current research with a C_3-symmetric macrocycle, expanding the possibilities of synthons in protein assembly, will also be presented.

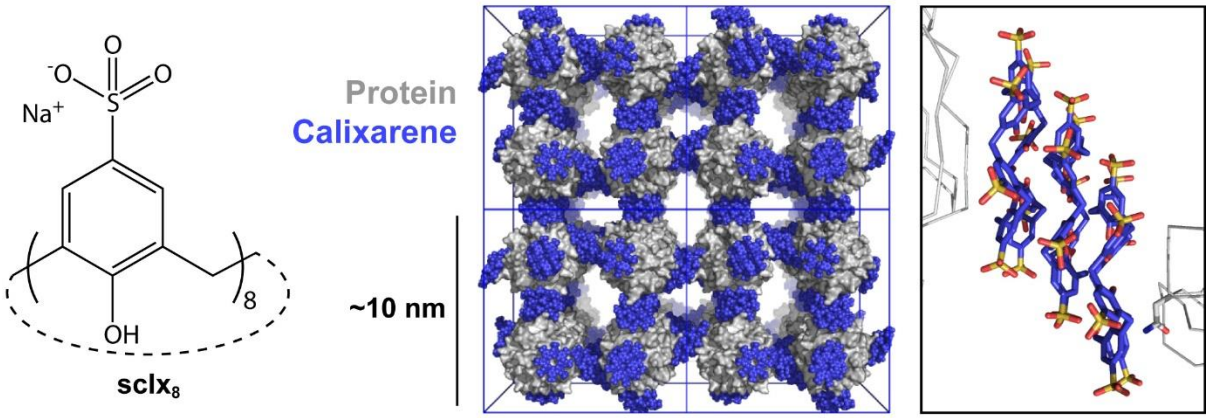

Figure 1. A cubic co-crystal structure of RSL and **sclx$_8$**. Protein *nodes* are connected by trimeric calixarene *links*.

References

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