Foldamers: expanding the chemical space

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Our group has developed helical foldamers – oligomers that adopt stable helical folded conformations – derived from aromatic amino acids.[1] Some of these folded objects have shown unprecedented conformational stability,[2] and constitute convenient building blocks to elaborate synthetic, very large (protein-sized) folded architectures (Figure 1).[3] They possess a high propensity to assemble into double, triple and quadruple helices.[4] Cavities can be designed within such synthetic molecules that enable them to act as artificial receptors [5] including for chiral guests. Water soluble analogues of these foldamers show promise in nucleic acid recognition.[6]

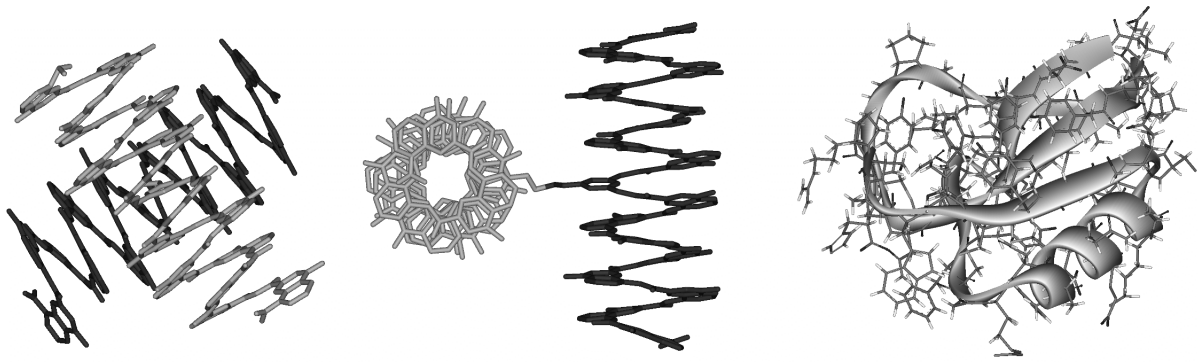

Figure 1. Crystal structure of a large foldamer comprised of two helices of opposite handedness at a 90° angle. The protein crystal structure on the right is shown as the same scale for size comparison.

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