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Metal-based Supramolecular Array, Space and Motion

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Supramolecular self-assembly of a certain number of designer organic/inorganic building blocks by directional interactions such as metal coordination is the basis of elaborate molecular systems functionalized with well-defined array, space and motion. Most molecular architectures are purpose-designed in light of the size, shape and surface natures of building blocks as well as chemical environments. On the other hand, we have occasionally come across unexpected structures and functions as a result of more complicated self-assembly processes than expected, which have often opened a new frontier in chemistry. The present lecture will highlight rational molecular design and serendipity in supramolecular chemistry by taking our recent examples of artificial metallo-DNAs, metallo-containers, molecular ball bearings, molecular gearing systems and metal macrocycle framework (MMF).