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Extending axial chirality in supramolecular coordination complex of nucleotide

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The research about chirality of coordination complexes and supramolecular assembly of nucleotide is significant for understanding the origin of life. In addition to the function of chirality delivery, the nucleotide ligands can also serve as a chiral inducer to generate new chiral sources. We have designed Co(II)-nucleotide-4,4'-bipy coordination system. Several kinds of coordinatuon complexes have been obtained and studied. Different kinds of chirality have been investigated comprehensively, including chiral coordination environment of metal center and supramolecular helix. Importantly, the axial chirality of the twisted 4, 4'-bipy has been captured and delivered along infinite one dimensional coordination chain by two effective strategies, which are coordination bonding and chiral inducing based on the nucleotide ligands for the first time. We defined this new kind of chirality is an Extended Axial Chirality (EAC). The absolute configuration of EAC has been analysized by X-ray single crystal diffraction method and solution- and solid-state circular dichroism (CD) spectroscopy. The relationship between structure and chirality properties were reationalized. This work will contribute to the nucleotide coordination chemistry and chiral materials design, and provides a facile method to construct an integrated chirality system.

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New developments in the Castagnoli-Cushman reaction toward drug disoceovery and lead generation

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The Castagoli-Cushman reaction is firmly establishing itself as the mainstream in multi-component chemistry. More recent contributions from our group not only advanced the heterocyclic product space accessible by this reaction to a completely new level but also gained some mechanistic insight into this important reactions. This, in turn, has allowed us making this reaction a far for amenable to plant setting and green chemisty standards. A number of drug leads have also emerged from these efforts which will be of interest to a wider durg discovery-minded audience.

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