

SUPPORTING INFORMATION FOR

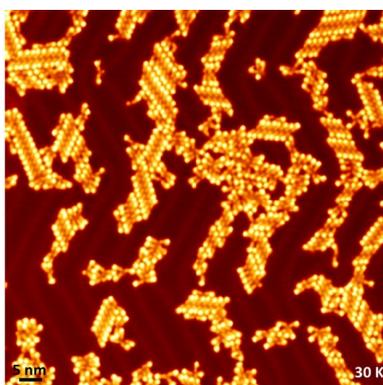
Kinetically controlled hierarchical self-assemblies of *all-trans*-retinoic acid on Au(111)

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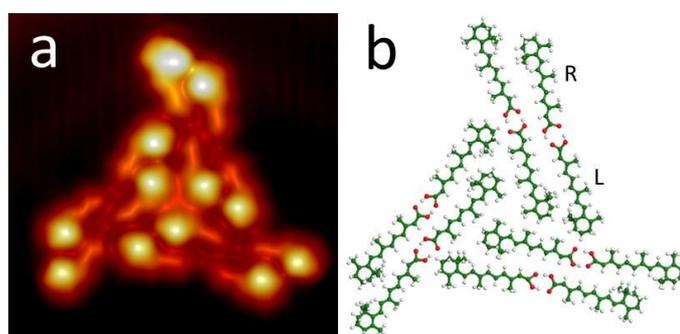
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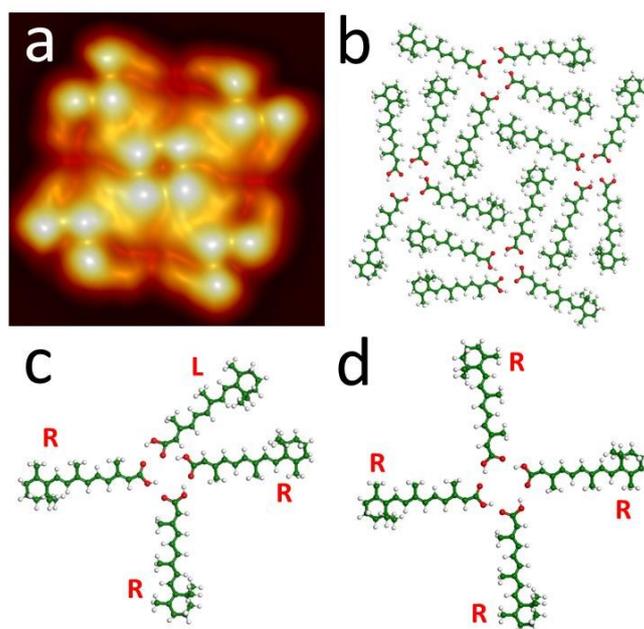
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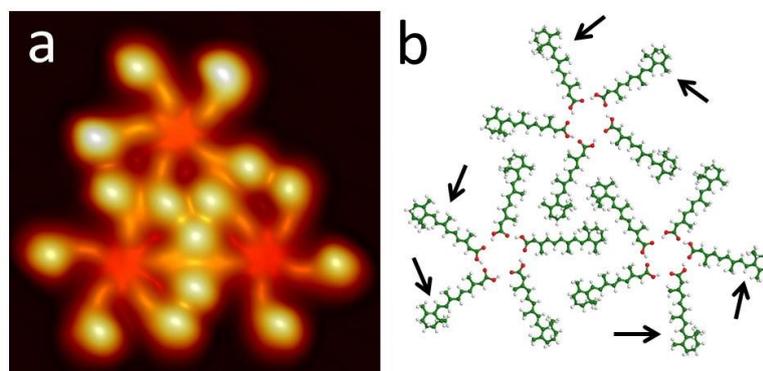
**Figure S1.** STM image of the 30 K prepared ReA/Au(111). When the ReA molecules were deposited onto the Au(111) substrate at around 30 K, both striped islands formed by dimers and disordered structures were observed



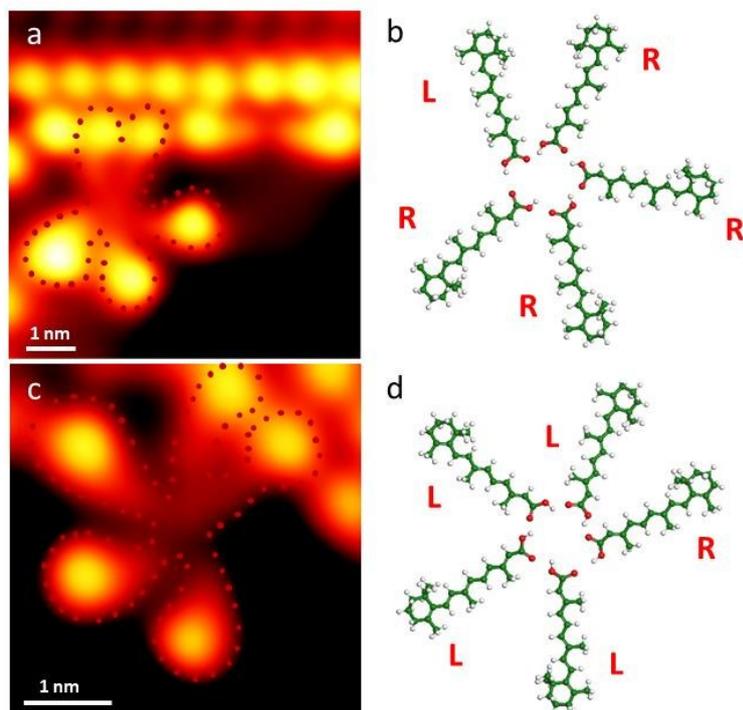
**Figure S2.** High-resolution STM image of a dodecamer (a) and its corresponding molecular model (b). The chirality of two ReA molecules of a dimer is labeled nearby.



**Figure S3.** High-resolution STM image of a hexadecamer (a) and its corresponding molecular model (b). The chirality of four ReA molecules of a tetramer in the hexadecamers (c) and tetramer patterns (d) is labeled nearby.



**Figure S4.** High-resolution STM image of a pentadecamer (a) and its corresponding molecular model (b). Six ReA molecules pointed by the black arrows in the pentadecamer only interact with adjacent ReA molecules through  $O\cdots H-O$  hydrogen bonds.



**Figure S5.** High-resolution STM images of two pentamers on Ag(111) (**a, c**) and their corresponding molecular models (**b, d**). The chirality of ReA molecules in pentamers is labeled nearby.