Supporting Information

Self-assembly of Hydrogen-bonded Supramolecular Complexes of Nucleic-acid-base and Fatty-acid at Liquid-solid Interface

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Materials and Experiment

Two kind of molecules, guanine (G) with 98% pure and stearic acid (SA) with ≥98.5% pure, were bought from Sigma-Aldrich Corporation. At room temperature, these powders were dissolved into 1-phenyloctane solvent (99% pure, Sigma-Aldrich Inc.) to produce G- and SA- saturated solutions, respectively. Then G-saturated solution was mixed with SA-saturated solution with the volume ratio of 1:1. After dropping their totally-mixed solution onto a freshly-cleaved substrate surface, scanning tunnelling microscopy (STM) characterization were carried out under ambient condition.

Characterization methods

All STM characterization was performed at the liquid/solid (1-phenyloctane/graphite) interface using a MultiMode SPM system with a Nanoscope IIIa controller (Veeco Instruments Inc., Santa Barbara, CA). STM tips were mechanically cut from a piece of Pt/Ir (80/20) wire with 0.25 mm diameter (Nanoscience

Instruments Inc., Phoenix, USA), and tested on freshly-cleaved highly oriented pyrolytic graphite (HOPG, grades ZYA and ZYB, Advanced Ceramics Inc., Cleveland, OH and NT-MDT, respectively) surfaces. All STM images were recorded in constant current mode and taken under various tunnelling conditions with tunnelling currents (0.5~1.0 nA) and tunnel voltages (0.5~0.8 V), and with the sample being biased positively.

Image Analysis and Theoretical Calculation

The images used in paper were subsequently processed using the correlation averaging method provided by the Scanning Probe Image Processor software (Image Metrology A/S, Lyngsø, Denmark). A maximum of 10 averages was adopted to improve the signal-to-noise ratio and to maintain the characteristic structural features of the molecular self-assembled patterns. In addition, all theoretical models for guanine and stearic acid depicted in manuscript were built by Material Studio or Hyperchem software according to specific conditions.

Results and Discussion

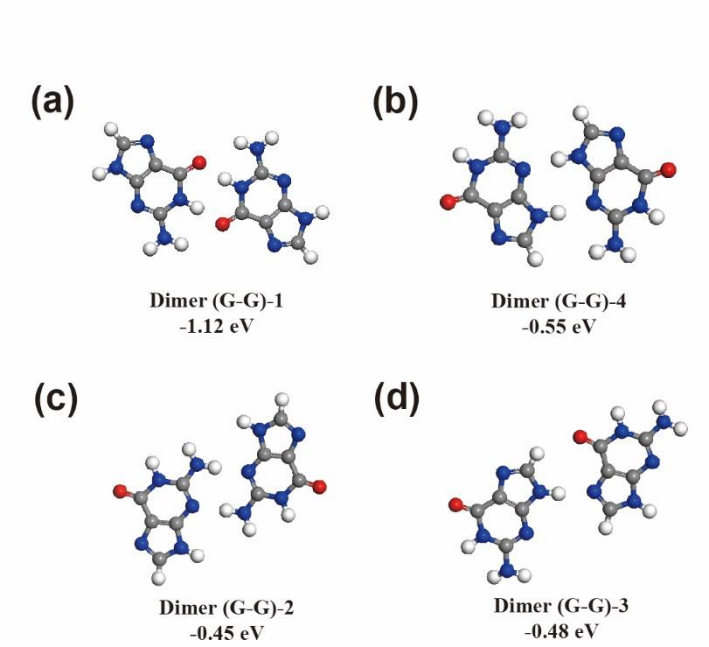

Fig. S1 Structural models of guanine-guanine dimers and their corresponding binding energies derived from theoretical calculations.