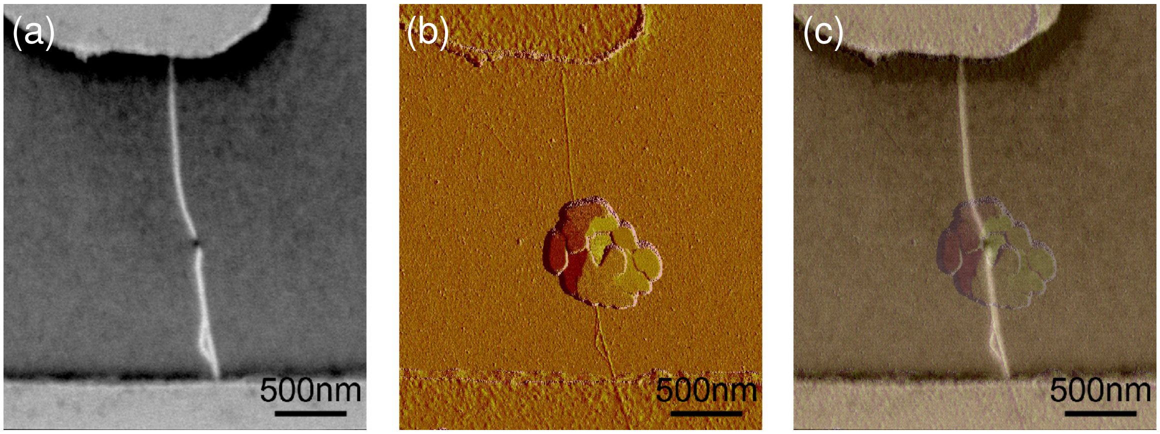

Figure S1. Image processing for depicting nanoscale pentacene transistors. (a) SEM image of a metallic carbon nanotube after electrical breakdown showing the nanoscale gap approx. 40 nm in length at the center. (b) AFM amplitude profile of a pentacene island deposited between the carbon nanotube ends. (c) Composite of the SEM and AFM images as those shown throughout the manuscript.

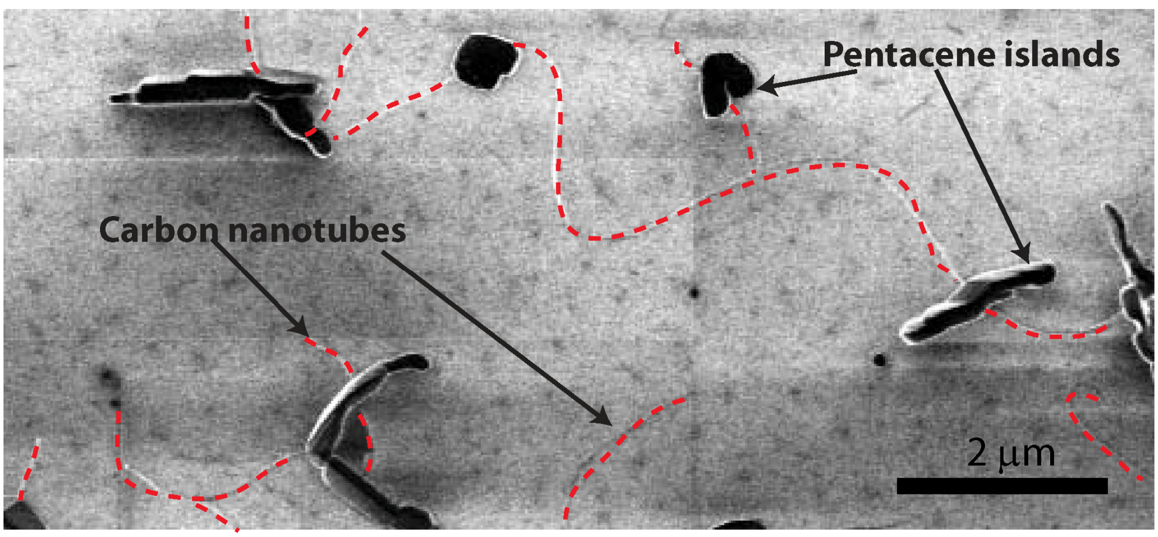

Figure S2. Nucleation of pentacene on carbon nanotubes. Spin-coated films of the pentacene adduct 13,6-N-Sulfinylacetamidopentacene were deposited on a SiO_2/Si wafer containing carbon nanotubes from a 2 mg/ml chloroform solution. These films were converted to pentacene by heating the wafers to 170-200 ºC. Pentacene islands are shown to nucleate preferentially on carbon nanotubes. Red dotted lines were added to the image in order to highlight the location of the carbon nanotubes.

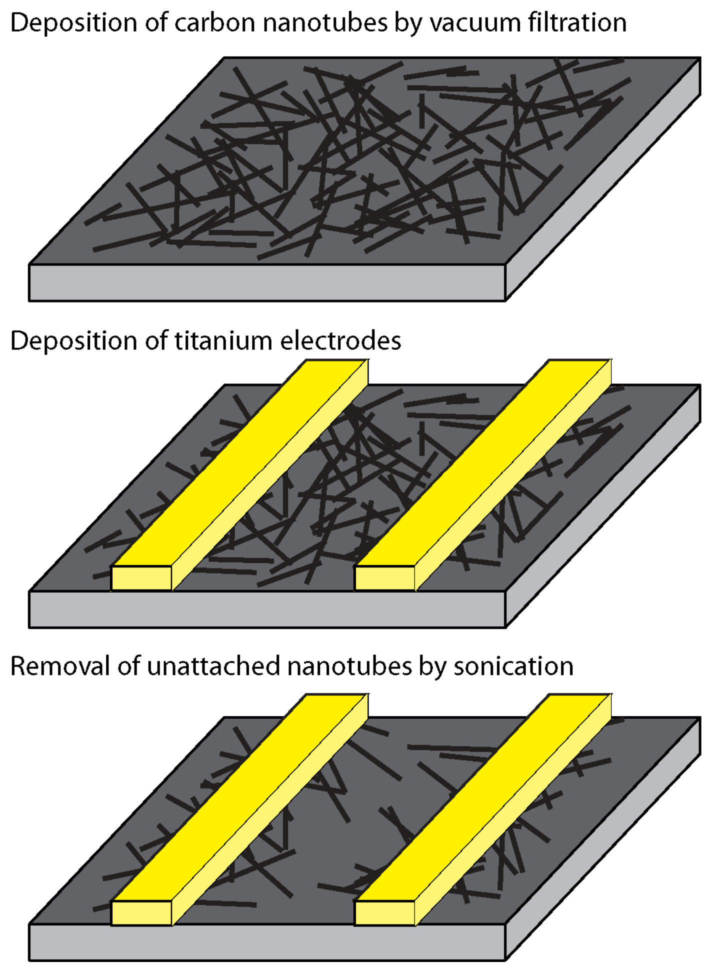

Figure S3. Fabrication procedure for carbon nanotube array electrodes attached to titanium contacts.

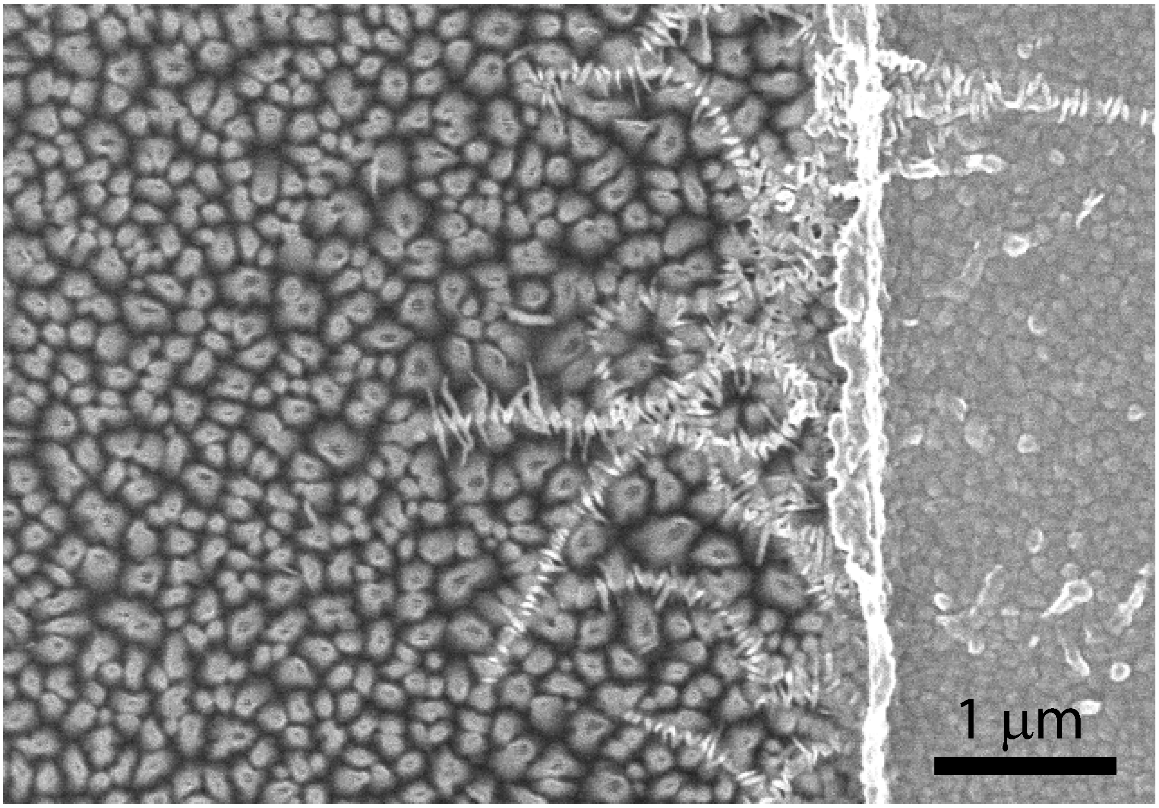

Figure S4. High magnification image at the proximity of pentacene OTFT devices contacted by carbon nanotube array electrodes showing different grain size and orientation of pentacene evaporated on carbon nanotubes.

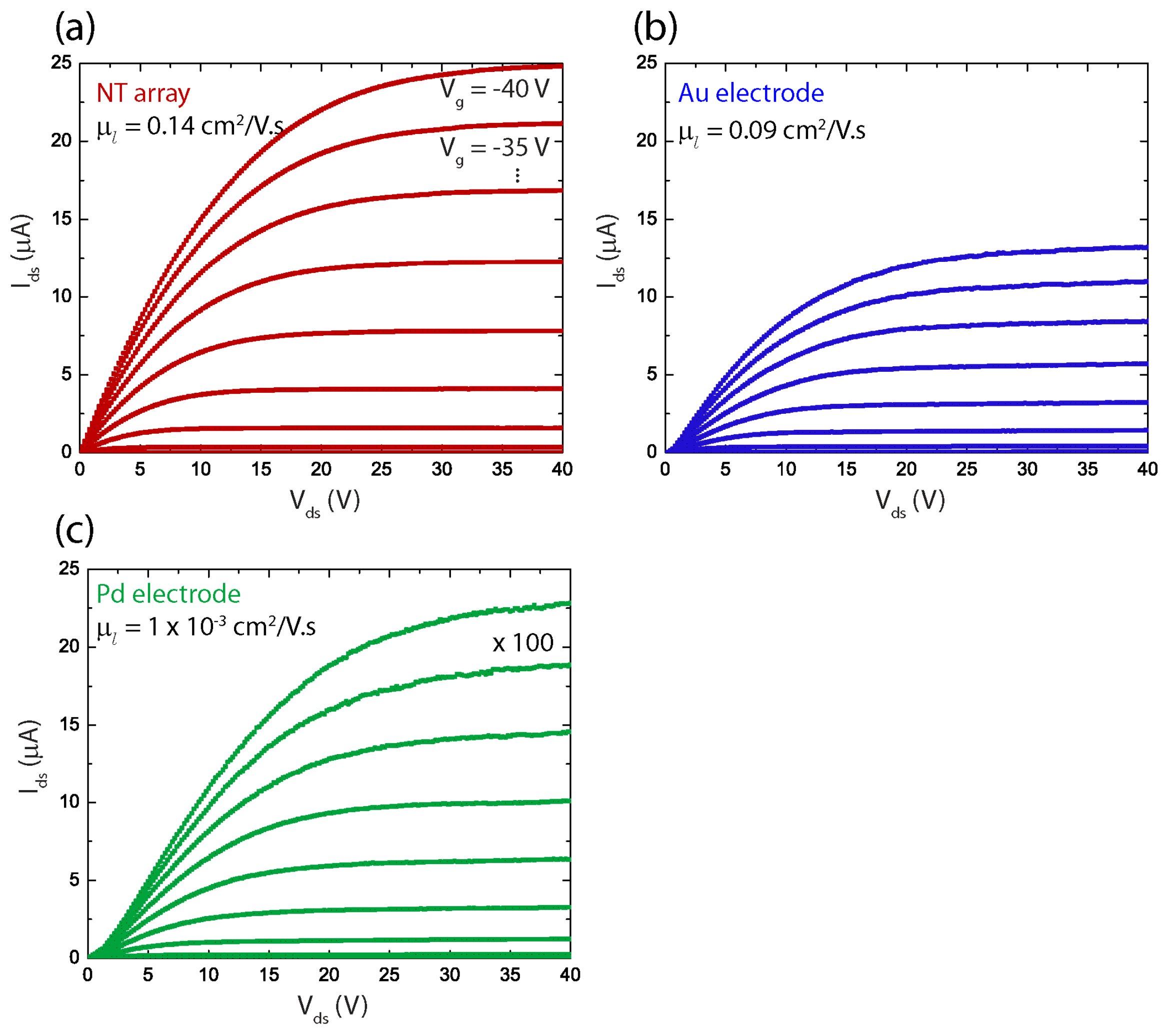

Figure S5. Output characteristics of pentacene OTFTs having (a) titanium contacted carbon nanotube array electrodes, (b) gold electrodes and (c) titanium electrodes. The current of the titanium contacted OTFT was multiplied ×100 for comparison purposes. The effective linear mobility was evaluated at V_{ds} = 10 V. All devices had channels 200 μm wide and 20 μm long.

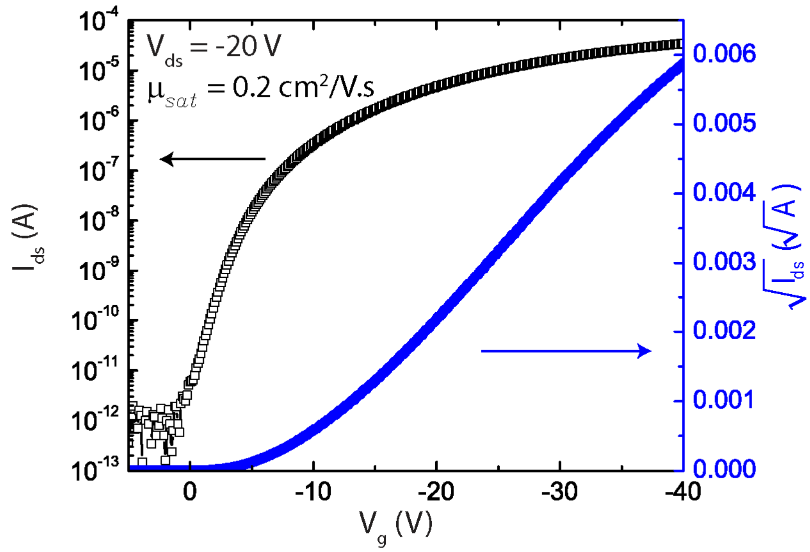

Figure S6. Transfer characteristics of pentacene OTFTs having titanium contacted carbon nanotube array electrodes and a geometry corresponding to W = 200 µm and L = 20 µm.