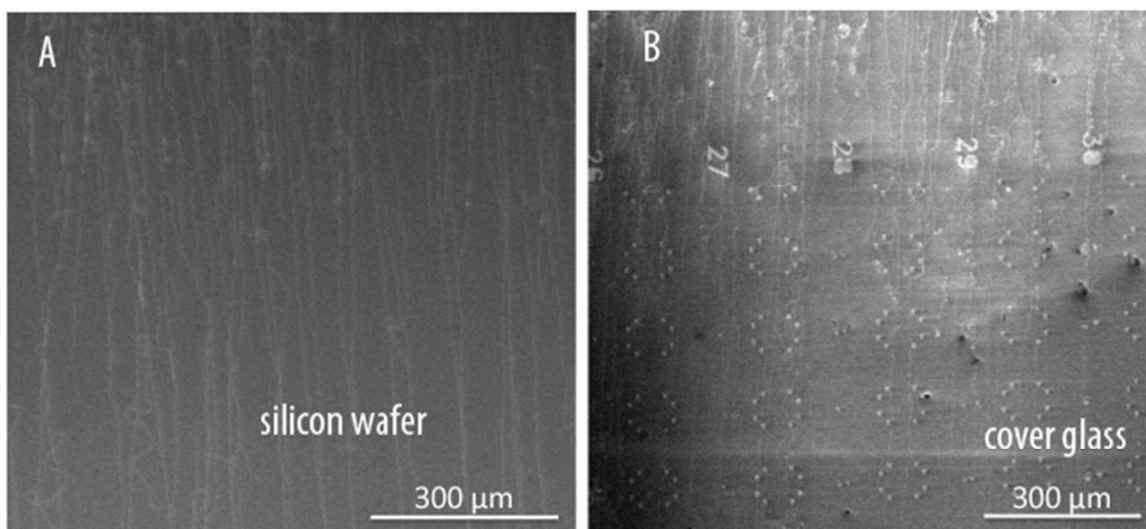


# Supplementary Online Material for Optical Detection of Single Molecule Translocation through Carbon Nanotubes

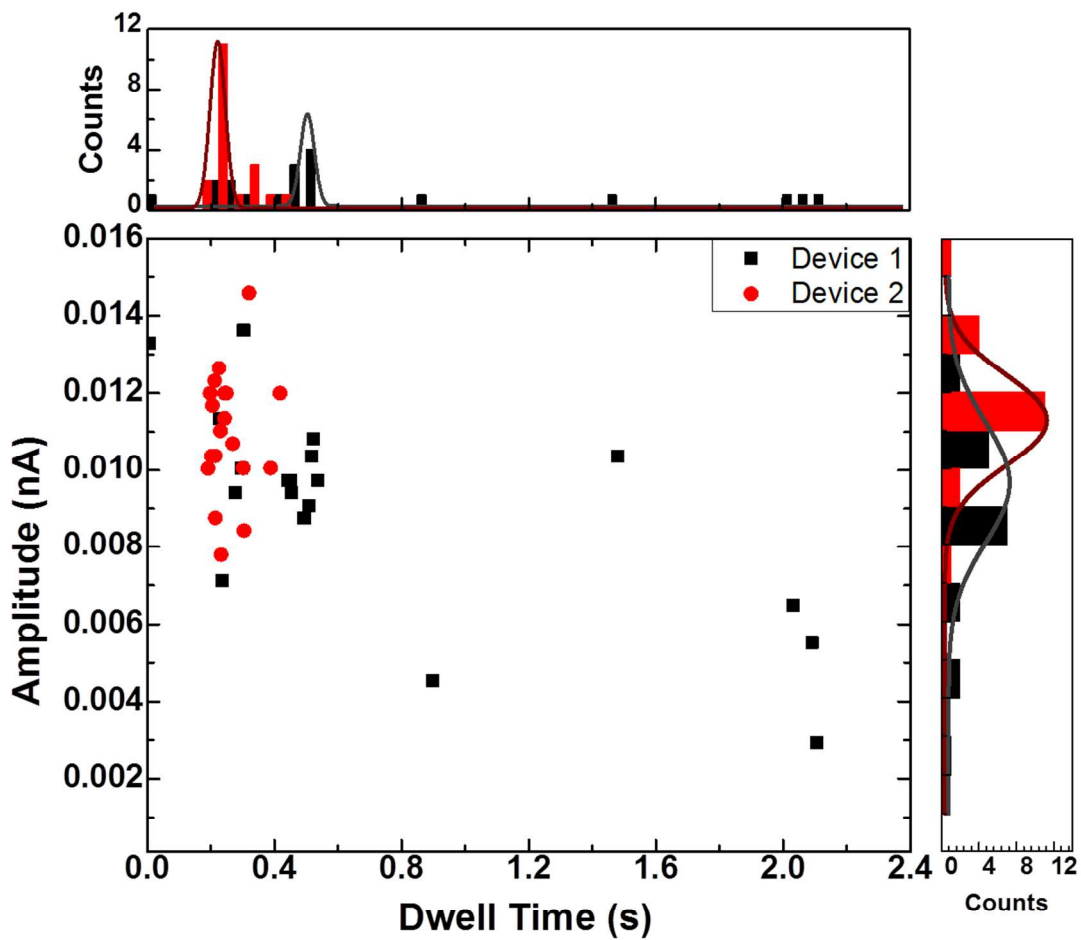
Weisi Song<sup>1,2</sup>, Pei Pang<sup>1</sup>, Jin He<sup>4</sup> and Stuart Lindsay<sup>1,2,3</sup>

<sup>1</sup>Biodesign Institute, <sup>2</sup>Department of Physics, <sup>3</sup>Department of Chemistry and  
Biochemistry, Arizona State University, Tempe, AZ 85287,

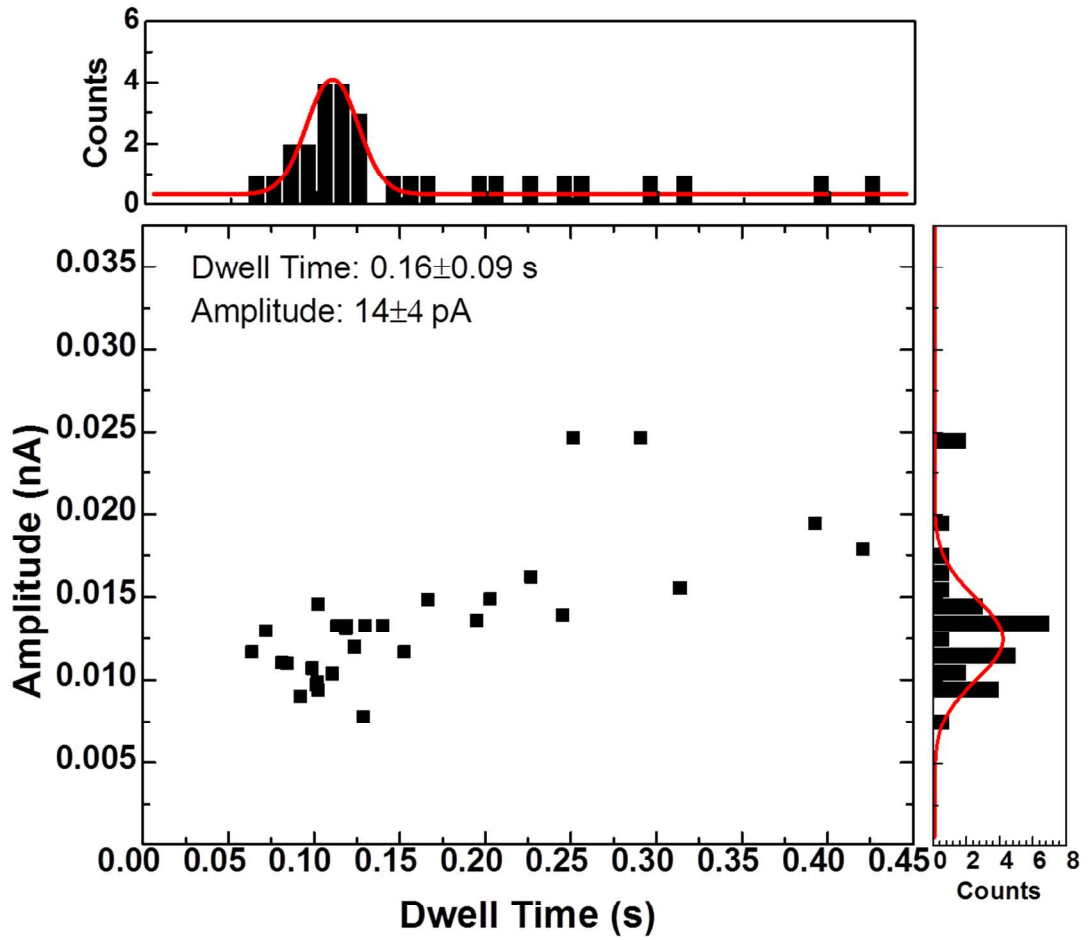
<sup>4</sup>Department of Physics, Florida International University, Miami, FL 33199



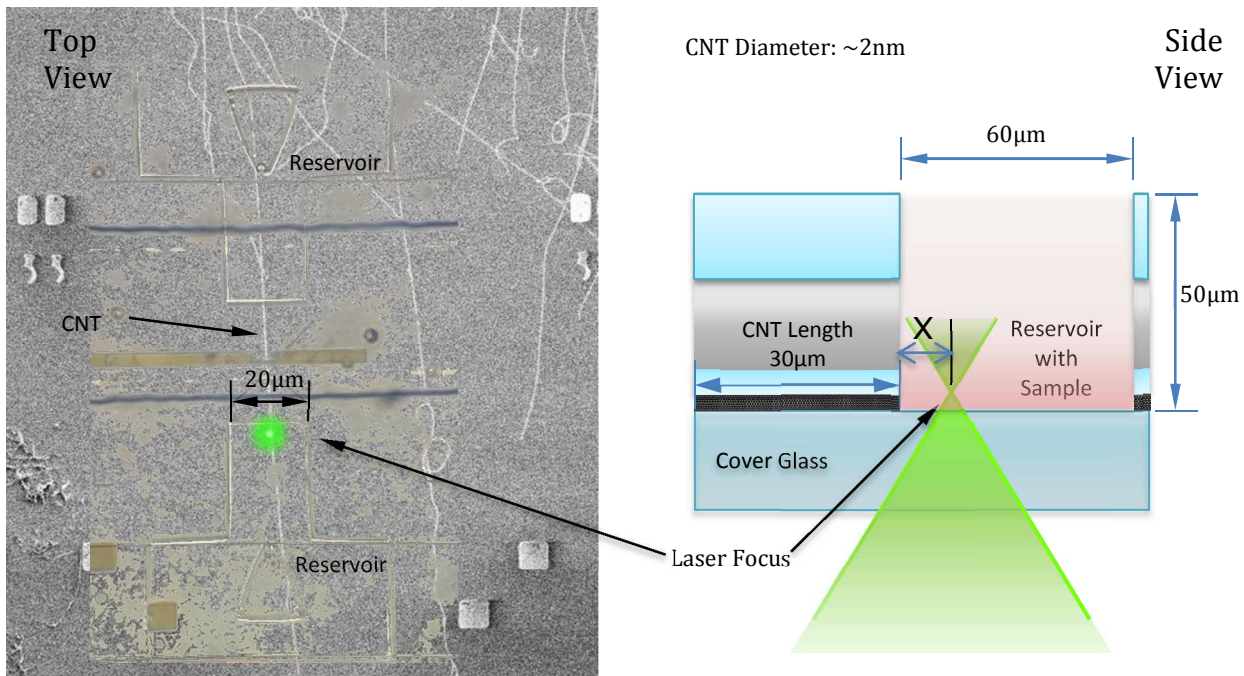
**Figure S1:** SEM images of SWCNTs as grown on thermal oxide on a Si wafer (A) and after PMMA embedding and transfer to a 0.16 mm thick cover glass (B). Index markers used to align the PMMA barriers are also visible.



**Figure S2:** Scatter plot of ion current peak amplitude vs. peak width for R6G translocation events (data for 2 devices, summary as described in the main text).

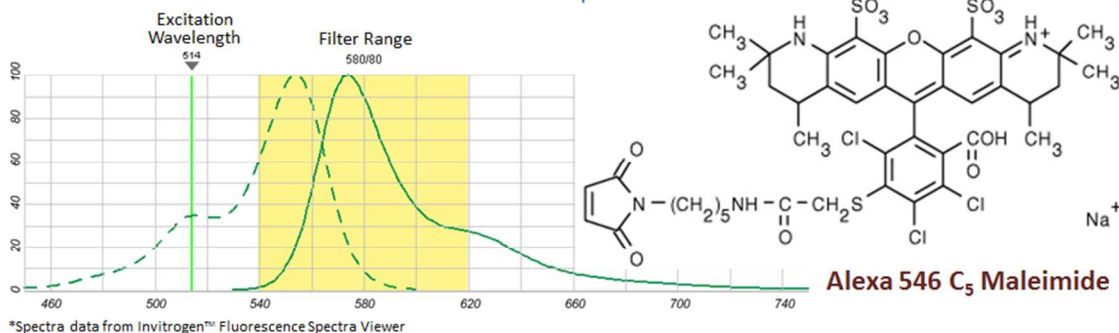


**Figure S3:** Scatter plot of ion current peak amplitude vs. peak width for Alexa 546 translocation events.

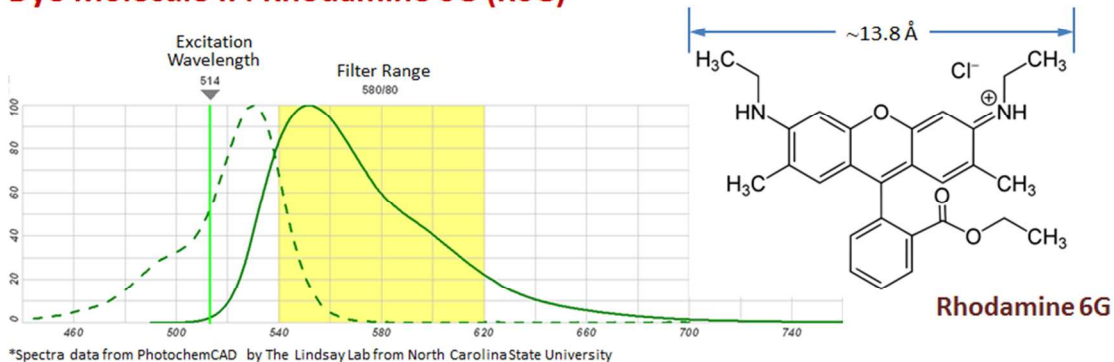


**Figure S4:** Optical scheme of fluorescence detection of dye molecule translocation. The SEM image on the left (PMMA removed) has been superimposed on an optical image (green spot is the laser) to show the position of the laser beam with respect to the reservoir. This is also shown schematically on the right.

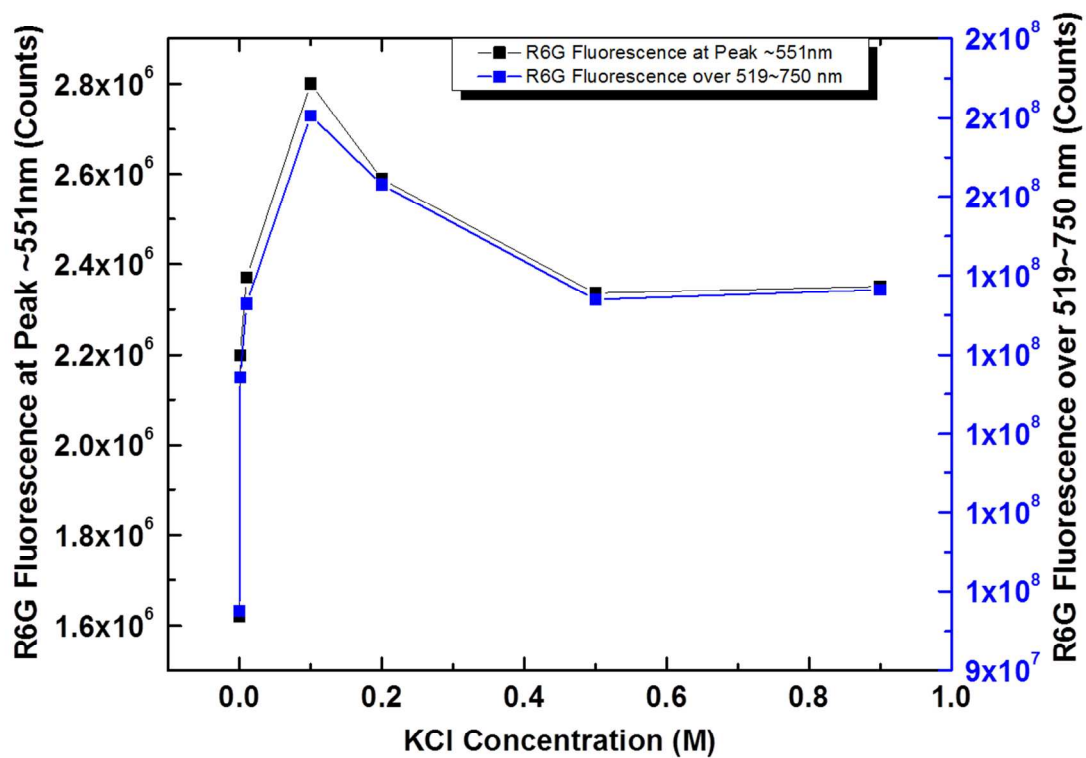
### Dye Molecule I : Alexa Fluor 546 C5 Maleimide (Alexa546)



### Dye Molecule II : Rhodamine 6G (R6G)



**Figure S5:** Absorption and emission spectra and structures of the dyes used in this work. The Alexa546 spectra come from the online SpectraViewer program by Invitrogen (<http://www.invitrogen.com/site/us/en/home/support/Research-Tools/Fluorescence-SpectraViewer.html>) and the R6G spectra are taken from the Oregon Medical Laser Center (<http://omlc.ogi.edu/spectra/PhotochemCAD/html/083.html>) based on data from Du, H., R.-C. A. Fuh, J. Li, L. A. Corkan and J. S. Lindsey (1998) PhotochemCAD: A computer-aided design and research tool in photochemistry. *Photochem. Photobiol.* 68, 141-142 for the absorption and Kubin, R. F. and A. N. Fletcher (1982) Fluorescence quantum yields of some rhodamine dyes. *J. Luminescence* 27, 455-462 for the emission.



**Figure S6:** Salt dependence of the fluorescence dependence of R6G

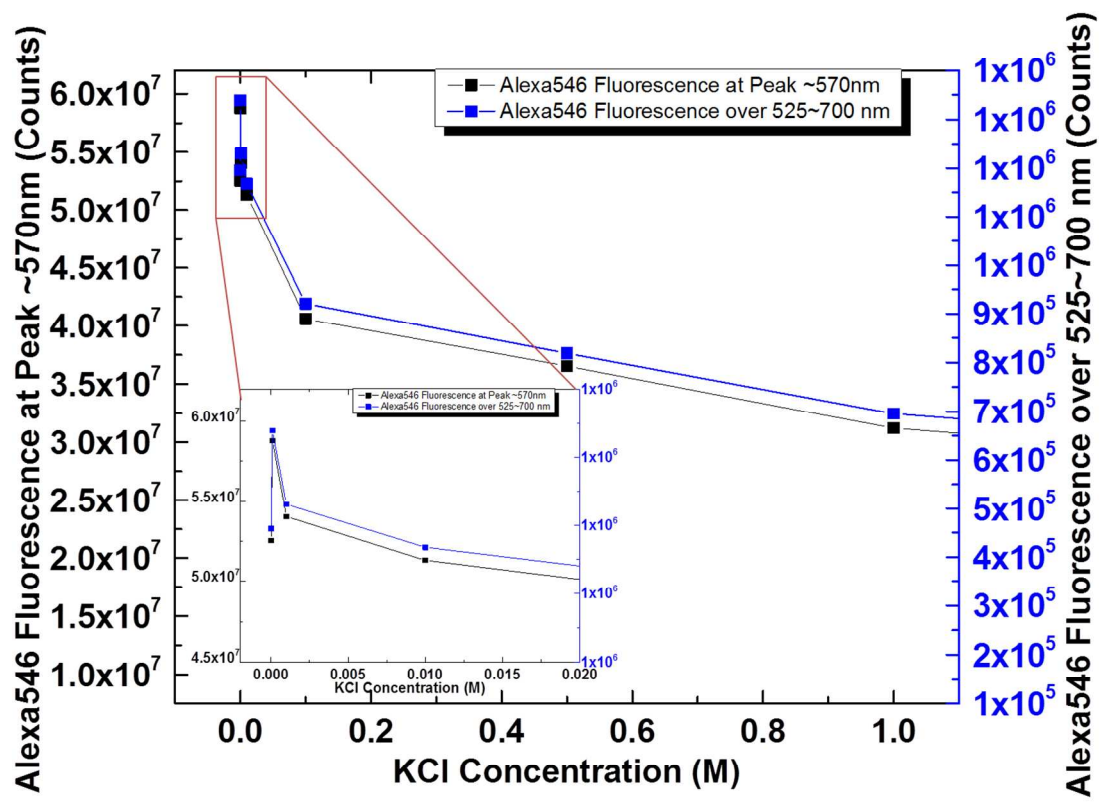


Figure S7: Salt dependence of the fluorescence dependence of Alexa 546