Supplementary Figures:

S0.

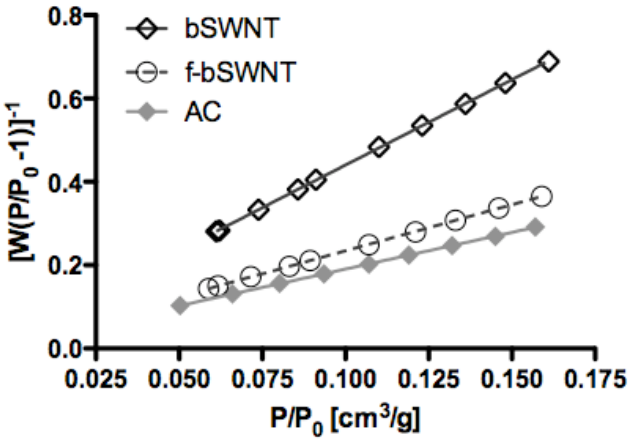


Figure S0. Brunauer-Emmett-Teller (B.E.T.) plot of the carbon groups derived from nitrogen physisorption. Physisorption and estimation of surface area were performed using an Autosorb-1 from Quantachrome (see materials and methods for surface area results).

S1.

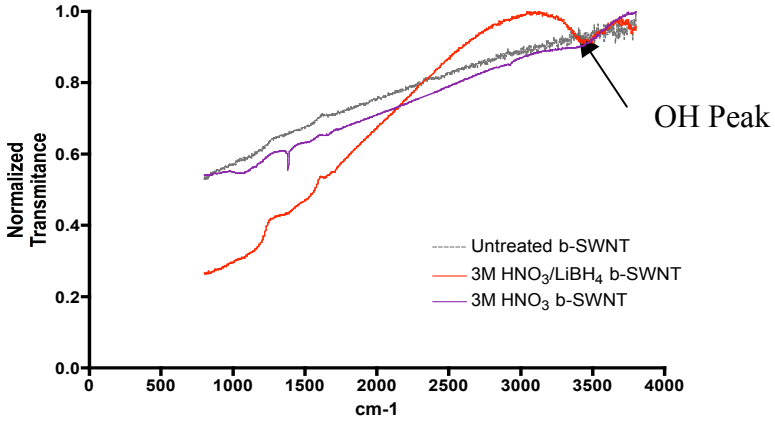


Figure S1. FT-IR spectra of bSWNT before/after chemical treatment. Broad hydroxyl peak can be detected at 3600 cm^{-1} after reduction with $LiBH_4$ of bSWNT previously treated with 3M HNO_3.

S2.

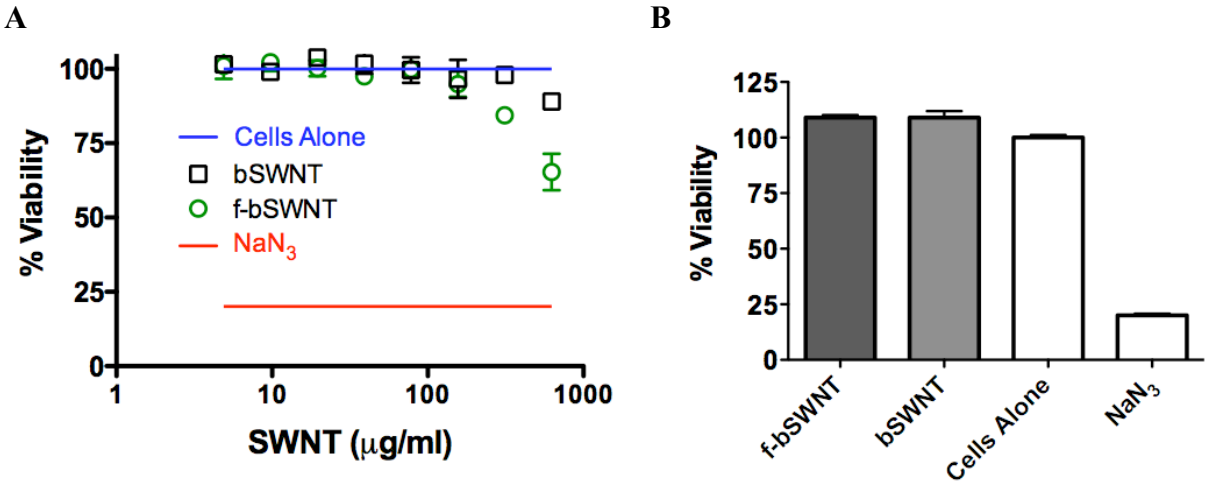


Figure S2. (A) Viability of splenocytes in presence of *f*-bSWNT and bSWNT at 24 hrs as compared to cells alone and a toxic salt (2.5% sodium azide). **(B)** Viability of cells from a separate study for cells incubated with *f*-bSWNT at 25 μg/ml and bSWNT at 41 μg/ml as used in the T cell stimulation studies. Both viability studies were performed using the Cell Titer-Blue® assay.

S3.

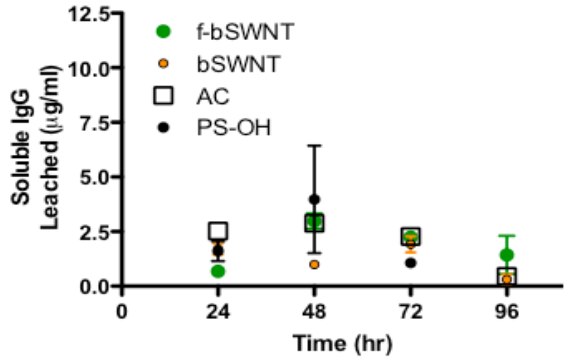


Figure S3. Leaching results of IgG adsorbed to *f*-bSWNT, bSWNT, AC and PS-OH at 37°C and at same conditions used in the T cell stimulation studies. Shown is an average of 2-2.5μg/ml leached over the course of 4 days (starting concentration 12.5 μg/ml)

S4.

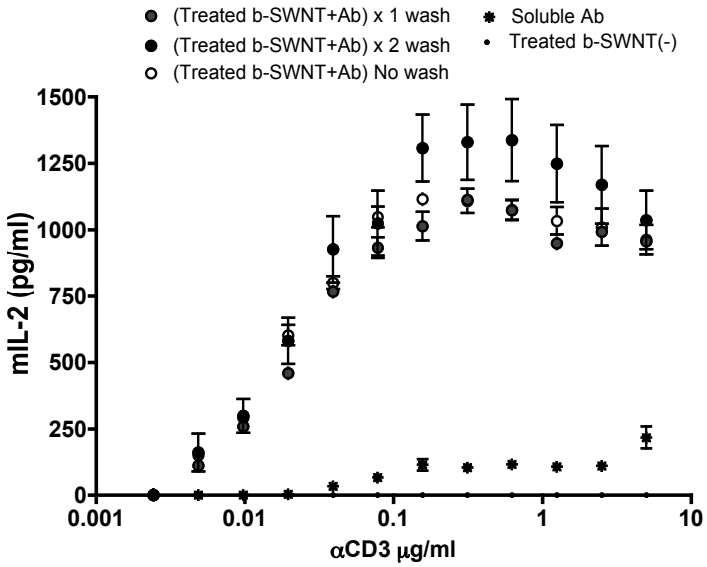
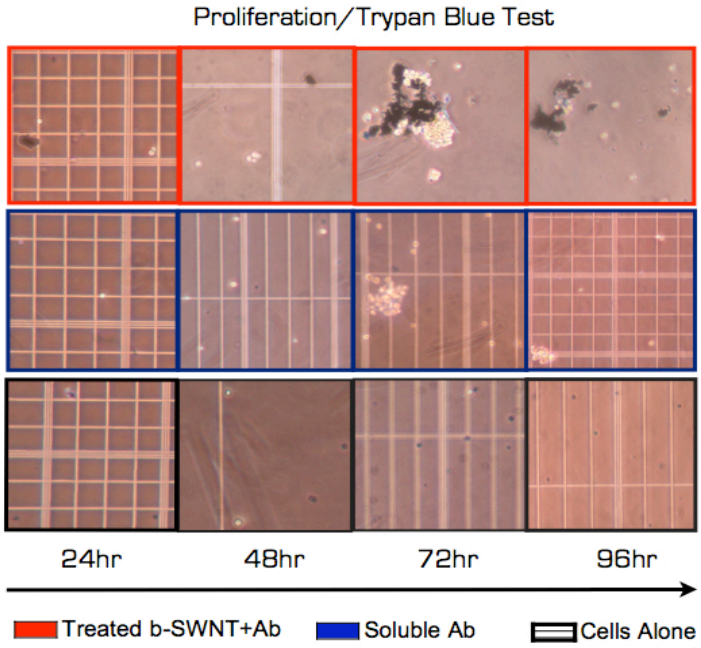


Figure S4. Low desorption of protein from the *f*-bSWNT surface: effect of two subsequent washes on antibody-adsorbed *f*-bSWNT as measured on the activation of B3z T cells (as previously described).

S5.

A



B

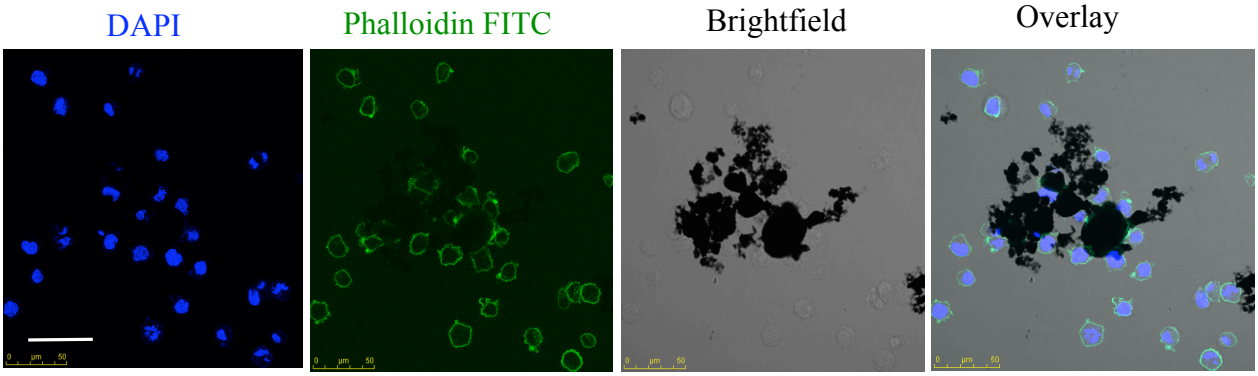


Figure S5. (A) Brightfield images of splenocytes during the four days incubation stained with Trypan Blue®. Dead cells appear as dark blue**. (B)** Confocal images of splenocytes and *f*-bSWNT +Ab at the 72hr incubation time point. White scale bar represents 50 μm. **(C)** 3D rendering of overlay (Quicktime file)

S6.

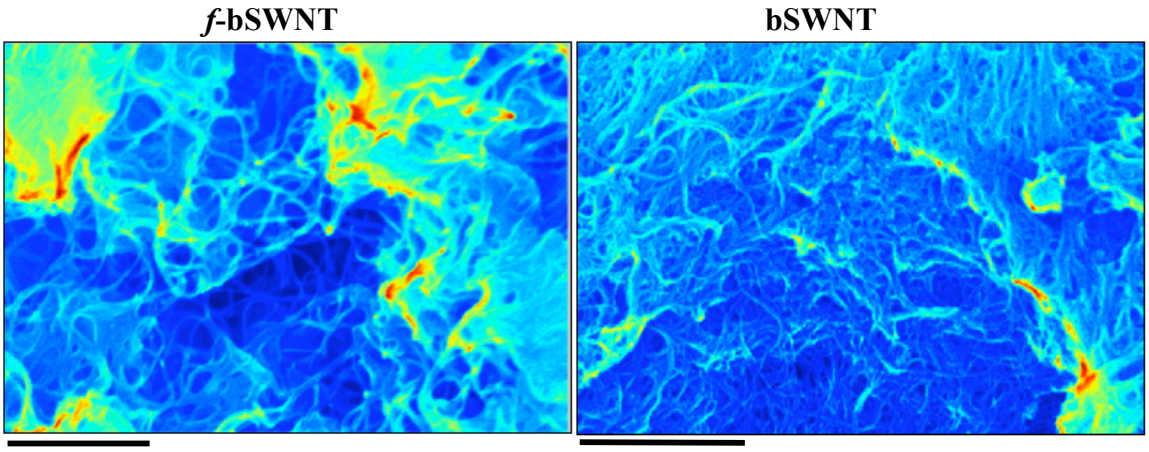


Figure S6. Semi-quantitative analysis of the surface roughness of SWNT bundles using MATLAB. Roughness analysis was determined by calculating the coefficient of variation of SEM images of bSWNT with or without treatment. The coefficient of variation is defined as the ratio of the standard deviation in image intensity to the mean image intensity. Refer to table S3 for statistical results. Black scale bar at the bottom of each image represents 500 nm.

S7.

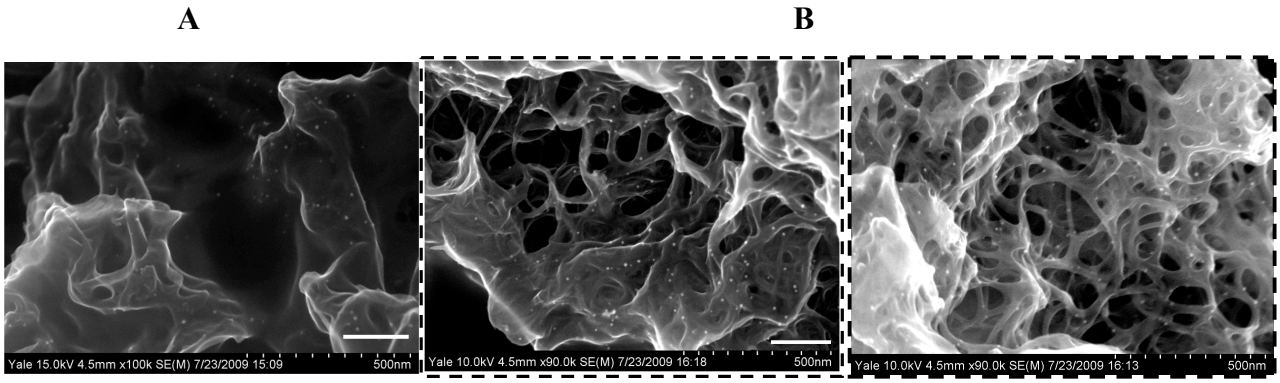
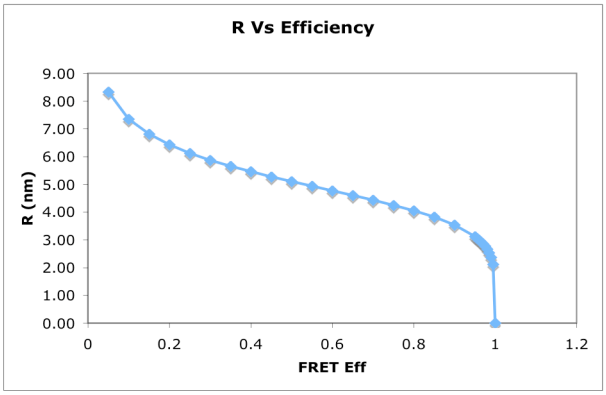


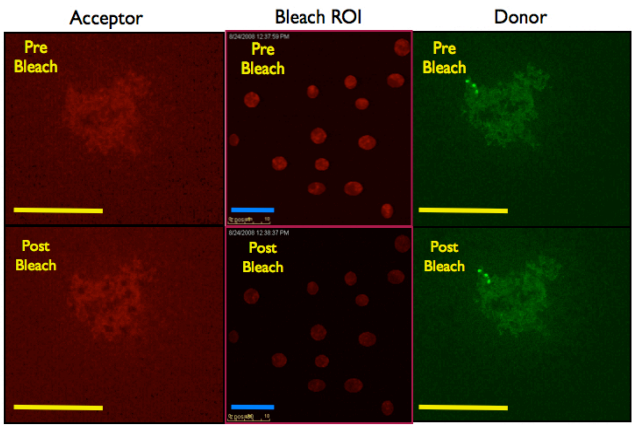
Figure S7. High-resolution SEM of SWNT bundles adsorbing nanogold labeled antibodies. **(A)** Variation in adsorption of nanogold labeled antibodies within a same region of interest. **(B)** Variation in adsorption of nanogold labeled antibodies within two regions selected from a single bundle. The white scale bar represents 500 nm.

S8.

A



B



C

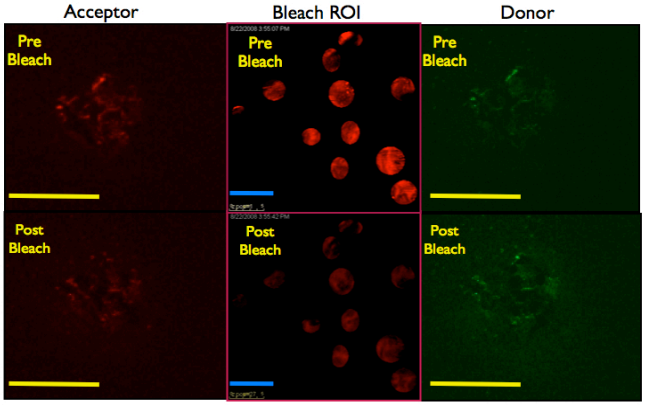


Figure S8. FRET-AP with the Alexa Fluor 555/Alexa Fluor 647 pair. (A) Estimation of the donor/acceptor distance as a function of FRET efficiency based on the FRET efficiency equation and the Förster radius for the FRET pair (see materials and methods). (B) FRET-AP donor and acceptor channels for untreated bSWNT, including bleaching of selected region of interests (ROIs). (C) FRET-AP donor and acceptor channels for activated carbon (AC), including bleaching of selected ROIs. The yellow scale bar represents 50 μm, the blue scale bar 10 μm

Table S1. Parametric values from the sigmoidal dose-response (variable slope) fitting on the results of T cell activation.

Group	24hr		48hr		72hr		96hr	
	A	EC50	A	EC50	A	EC50	A	EC50
Treated b-SWNT+Ab	74.84	0.81	224.80	0.21	284.60	0.06	314.20	0.11
Untreated b-SWNT+Ab	70.42	0.89	138.00	0.48	164.10	0.60	202.50	0.67
PS-OH+Ab	15.62	0.56	98.84	0.25	153.50	0.01	155.30	0.02
AC+Ab	42.77	0.75	145.90	0.22	157.90	0.00	154.70	0.13
Soluble Ab	3.00	4.34	83.65	0.49	131.00	0.00	91.17	0.01

Table S2. Parametric values derived from the one phased exponential fit of IgG adsorption onto *f*-bSWNT and bSWNT as compared to previously derived values from BSA adsorption[3] (Units: Y_{max} values in μg protein/mg SWNT)

	f-bSWNT		bSWNT		Y_{max1}/Y_{max2}	K_1/K_2
	Y_{max1}	K_1	Y_{max2}	K_2		
BSA	508 ±23	2.5E-3 ±3E-4	175 ±6	6E-3 ±7E-4	2.9	0.4
IgG	265 ±32	4E-3 ±8E-4	99 ±6	1.4E-2 ±2E-3	2.7	0.3

Table S3. Results from the statistical analysis performed on SEM images of bSWNT and *f*-bSWNT using MATLAB

	***f*-bSWNT**	**bSWNT**
Mean	61.4	58.9
Variance	535.4	179.6
Standard Deviation	23.14	13.4
Coefficient of Variation	0.4	0.2

Supplementary materials and methods.

Protein adsorption isotherm estimation for bSWNT and f-bSWNT. IgG-2a was used as a model protein for the adsorption studies. A sample obtained from a sterile stock of bSWNT or *f*-bSWNT was suspended in PBS to a concentration of 300 μg/ml then sonicated for 10 minutes to obtain uniform dispersion. IgG-2a at 100 μg/ml was serially diluted at 200 μl in 1X PBS. The SWNT sample was then dispensed at an equal volume of 200 μl into the prepared IgG samples. The mixture was allowed to mix in a rotary shaker at 4^{o}C overnight. SWNT mixtures were then centrifuged in a micro-centrifuge at

13,200 rpm for 20 minutes. The supernatant was removed and analyzed for protein content using the μBCA assay. The amount of IgG loaded onto bSWNT an *f*-bSWNT was deduced from a simple mass balance based on the difference in protein concentration before and after SWNT addition.

References.

1. Lim, S., et al. Journal of physical chemistry C, 2007.
2. Jorio, A., et al. Physical Review Letters, 2001, *86*, 1118-21.
3. Fadel, T. R., et al. Nano letters, 2008, *8*, 2070-2076.