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Highly Sensitive One-dimensional Material-based Biosensor For Residual Cancer Cell Detection

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MD Simulation shows that the cancer lipid bilayer is less rigid than healthy lipid bilayer after CNT is embedded

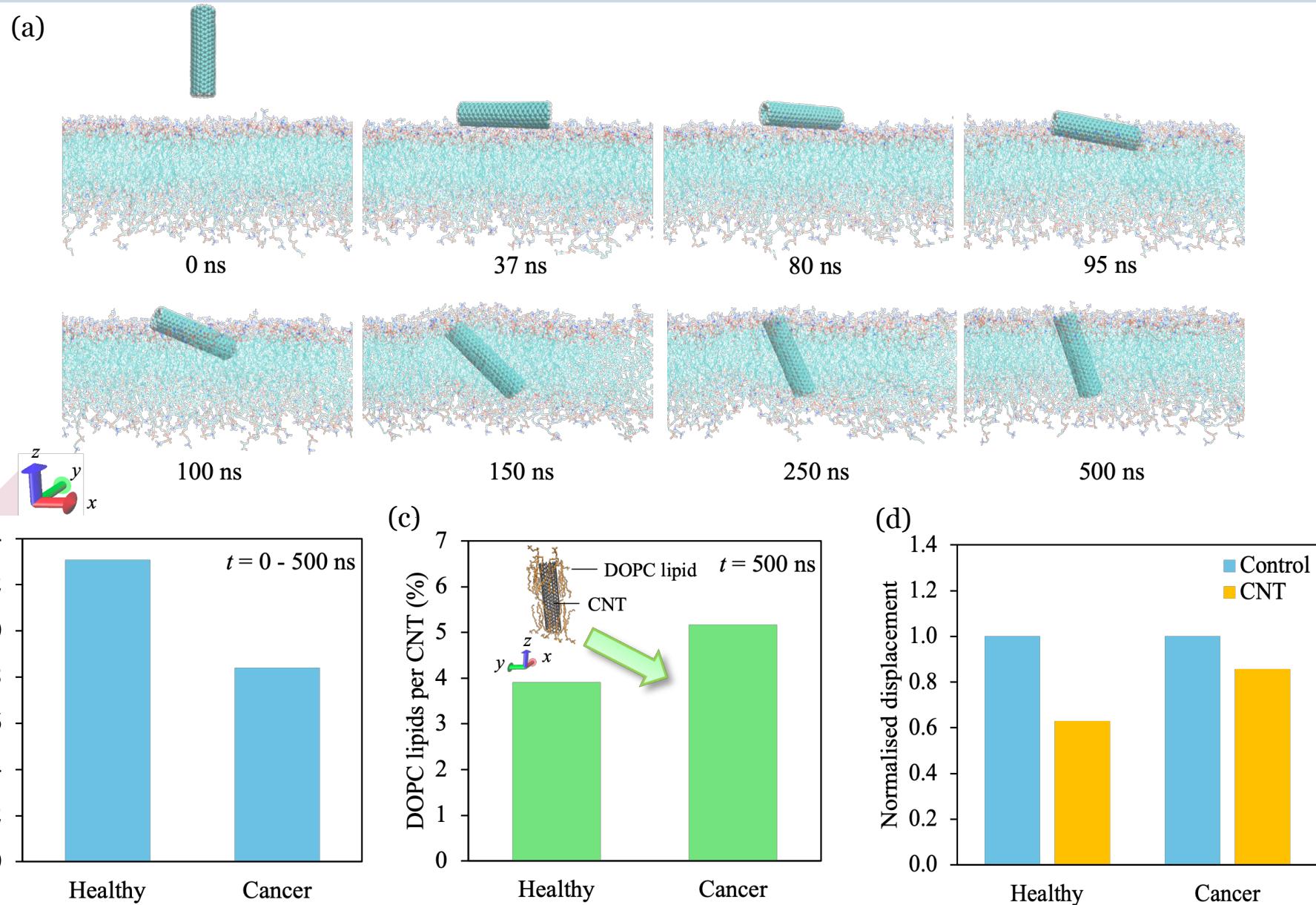
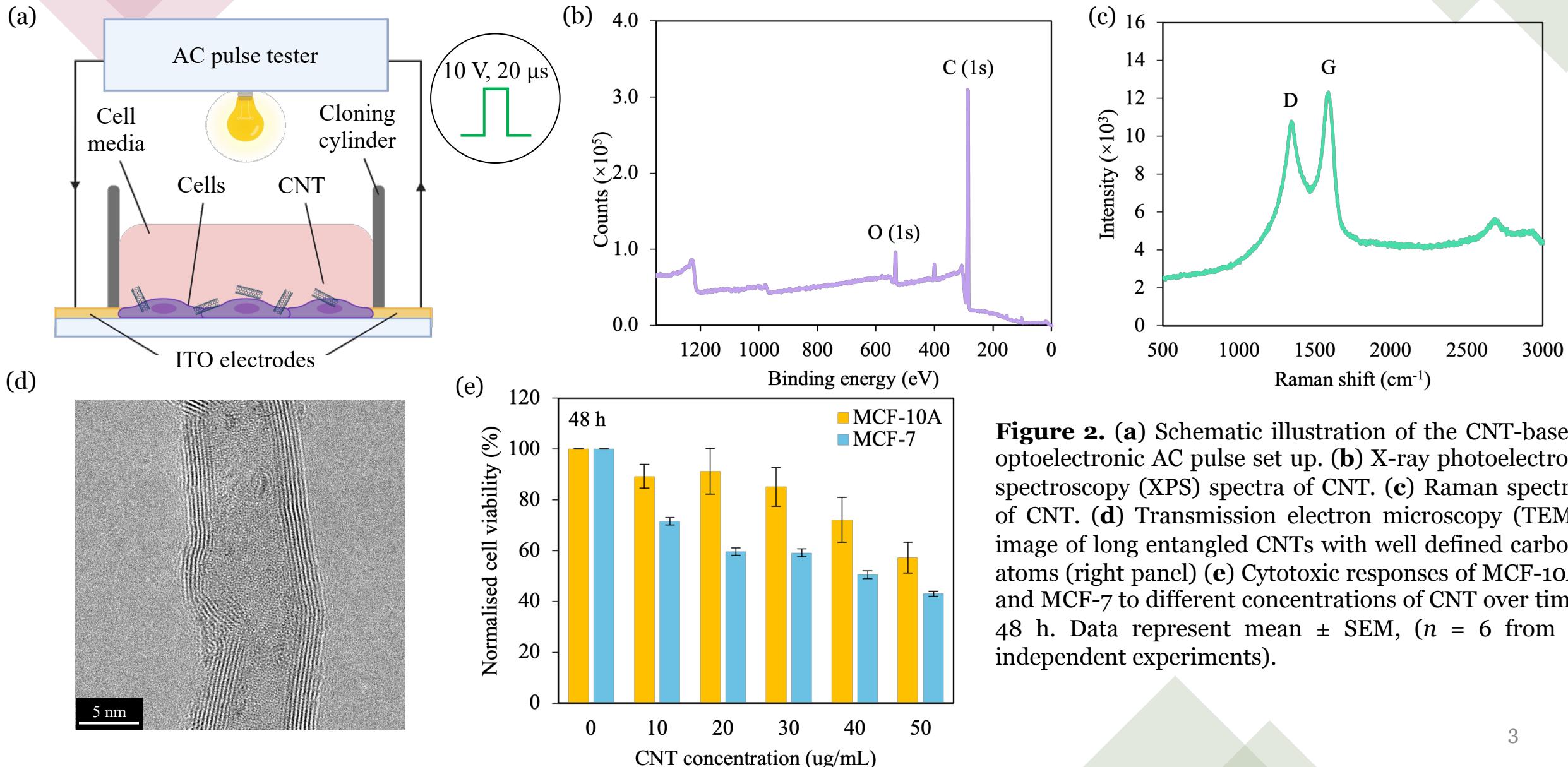


Figure 1. (a) CNT spontaneously interacting with the lipid bilayer over 500 ns via hydrophobic interactions. Snapshots are representative of both cancer and lipid bilayer models. (b) Average adhesion energy between the CNT and the healthy and cancer lipid bilayer systems. (c) Percentage of DOPC lipids interacting with CNT within the two different systems. The cut-off distance was 6 Å. The inset shows a snapshot of CNT (black) interacting with DOPC lipids (orange) within the cancer lipid bilayer. (d) Self-diffusion coefficient for both lipid bilayer systems with CNT (yellow) normalised to control (blue).

CNT-based optoelectronic AC pulse set up and CNT characterisation and cytotoxicity



CNT-based optoelectronic pulse system is able to detect a subpopulation of MCF-7 cells within a heterogenous cell population

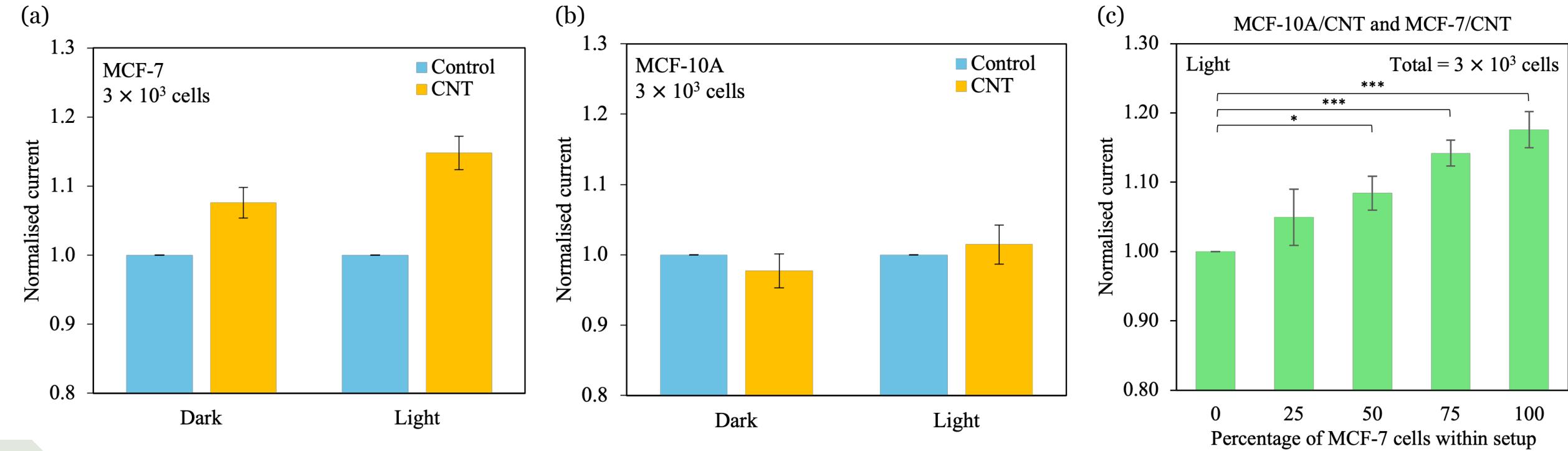


Figure 3. Normalised current output plotted for **(a)** MCF-7 cells and **(b)** MCF-10A cells with and without CNT incubation in dark and light conditions. Values were normalised to cells without CNT (control). **(c)** Normalised current was plotted as a percentage of MCF-7 cells within the heterogenous population. Current output was normalised to MCF-10A cells alone (0%). Different percentages of MCF-7 (25%, 50%, 75%, 100%) were plated within total cell population ($n = 3 \times 10^3$ cells). Data represent mean \pm SEM, ($n = 6$ from 3 independent experiments). Significance was calculated using Student's t-test and is presented as: * ($p < 0.05$) and ** ($p < 0.001$).

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