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Distant-ion dragging of polarizable nanodroplets and solvated DNA on nanotubes BOYANG WANG, PETR KRAL, University of Illinois at Chicago, PROF. KRAL'S RESEARCH GROUP TEAM — Long distance Coulombic coupling allows efficient molecular dragging at the nanoscale by moving electrons, ions and molecules [1]. We use molecular dynamics simulations to show that ions intercalated inside semiconducting single-wall carbon nanotubes (SWNT) can be solvated in polarizable nanodroplets adsorbed on the SWNTs, and the coupled systems can be dragged by electric fields [2]. We also demonstrate that solvated single-strand DNA molecules adsorbed on SWNTs can be driven by ionic solutions flowing inside the tubes. These phenomena could be applied in molecular delivery, separation, desalination and be integrated in modern lab-on-a-chip technologies. [1] Boyang Wang and Petr Kral, JACS 128, 15984 (2006). [2] Boyang Wang and Petr Kral, submitted.

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