Abstract Submitted
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Photoconductivity in DNA-Porphyrin Complexes[1] PECO MYINT, EMMA OXFORD, COLLENCE NYAZENGA, WALTER SMITH, Haverford College, ZHENGQING QI, A.T. JOHNSON, University of Pennsylvania — We have measured the photoconductivity of $\lambda-$DNA that is modified by intercalating a porphyrin compound, *meso*-tetrakis(N-methyl-4-pyridiniumyl)porphyrin (TMPyP), into its base stacks. Intercalation was verified by a red shift and hypochromism of the Soret absorption peak. The DNA/porphyrin strands were then deposited onto oxidized silicon substrates which had been patterned with interdigitated electrodes, and blown dry. Electrical measurements were carried out under nitrogen, using illumination from a 445 nm laser; this wavelength falls within the absorption peak of the DNA/porphyrin complexes. When initially measured under dry nitrogen, the complexes show no photoconductivity or dark conductivity. However, at relative humidities of 30% and above, we do observe dark conductivity, and also photoconductivity that grows with time. Photoconductivity gets larger at higher relative humidity. Remarkably, when the humidity is lowered again, some photoconductivity is now observed, indicating a change that persists for more than 24 hours. It may be that the humidity alters the structure of the DNA, perhaps allowing for better alignment of the bases.

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