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CONSTRUCTION OF DNA-METAL NANOPARTICLES Marvin H Caruthers

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Diboranephosphonate and boranephosphonate DNAs deposit, via a redox reaction, gold, silver, platinum, and palladium on to DNA arrays and nanotubes. Moreover dinucleotides having the diborane or boranephosphonate linkages yield extended DNA fibers several microns/nanometers in length and, when treated with gold salts, form deposits of gold nanoparticles along the length of the fibers. In collaboration with Agilent Technologies, we have developed methods and instruments for the synthesis on glass chips of DNA and RNA containing up to 300 nucleotides per segment. Applications include biological research on genomes, RNA for CRISPR/Cas9 formulations and data storage.

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Figure 1 Diborane-phospho-nate DNA

Figure 2 Borane-phos-phonate DNA