Supplementary Materials for

The Genome Project–Write


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Fig. S1
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Fig. 1. Synthesizing synthetic or semisynthetic genomes. A. Efficiency trends in DNA sequencing (green) and synthesis of double-stranded DNA (dsDNA, blue) and single-stranded DNA (ssDNA, red) over the past ~35 years. Double-stranded DNA, or gene synthesis, has improved noticeably over the past ~10 years, but still lags behind sequencing and ssDNA synthesis. The disruptive improvement in sequencing and ssDNA (oligonucleotides) synthesis technologies has improved from multiplex and miniaturization technologies in high-throughput DNA sequencing and oligo microarray technologies, respectively. Commercial gene synthesis technologies relies on both oligo synthesis (building blocks) and sequencing (validation of synthesis) technologies. B. Graphical representation of four representative genomes benchmarked to the size of the 3,000 MB human chromosomes: 9.5 kb hepatitis C virus (HCV) enlarged ~380,000-fold, 1.1 MB Mycoplasma mycoides enlarged ~1,000-fold, 12 MB yeast enlarged 100-fold.
Bibliography
As further support for the arguments in our paper, this is a (non-comprehensive) sampling of precedents for projects that could take advantage of radical reduction in cost of genome-scale synthesis and high-throughput cellular/organismal testing of consequences. As with HGP-read, this effort need not be restricted to human but could and should include mouse, pig, Drosophila melanogaster, Caenorhabditis elegans, Arabidopsis thaliana, Saccharomyces cerevisiae, etc. The bibliography, along with proposals for pilot projects, maybe found online at the project web site www.hgpwrite.org

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