applications may benefit from enzymatic synthesis, as most molecules would have the 5′ bases including the target region.

Palluk *et al.*[3] have shown a proof of concept of enzymatic synthesis. While the extension of at-most ten bases to an oligo with stepwise base incorporation efficiencies ranging from 93.4 to 99.5% is at the lower range of efficiencies of standard chemical syntheses, it is likely that adoption of methods common in phosphoramidite synthesis, such as controlled glass pore supports, precise reaction chambers, and rigorous quality control of reagents, can increase efficiency substantially. The authors point out that the primary by-product observed was oligos containing deletions[3], suggesting the presence of untethered nucleotides or incomplete cleavage of the transferase, both of which may be amenable to optimization.

The work of Palluk *et al.*[3] raises interesting questions about the future of DNA synthesis and synthetic biology. Facile production of long, high-fidelity DNA would likely galvanize the synthetic biology industry and could hasten the replacement of traditional chemical manufacturing by biological manufacturing. Converting this method to a process that can compete with phosphoramidite-synthesized oligos will require more than optimization and automation, however. The current oligo quality control methods, such as mass spectrometry and capillary electrophoresis, both lack the resolution to measure the exact content of kilobase-long oligos, and other approaches, such as next-generation sequencing, may be required. As the construction of more complicated molecules expands, so does the possible range of errors. It is likely that we will need to rethink not just the uses of the molecules but the way in which we assess them.

COMPETING INTERESTS
A.C. is employed by Integrated DNA Technologies, from which oligos use in the experiments described in Palluk *et al.* were purchased.

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