



FIGURE 18.5. Adaptation of 12 *Escherichia coli* populations to live on minimal medium with glucose as the sole carbon source. (A) Decrease in total catabolic function calculated as the average of the growth rate measured on 64 different substrates relative to the ancestor. *Open circles* indicate populations that evolved high mutation rate. The *solid line* shows the mean across the low mutation rate lines and the *dashed line* the mean across the high mutation rate lines. (B) The detailed response to life in a new environment varied between replicate populations. The numbers show the number of populations that grew more slowly on each substrate than the ancestor did. *Red* highlights functions that consistently decayed; *turquoise* indicates two cases where there was a significantly improved function. (C) Variation in fitness among the replicate populations during the first 10,000 generations. *Curves* are fitted to measurements made every 500 generations. (D) Frequencies of deletions to the ribose operon, which eventually fixed in all 12 replicates.

18.5A,B, redrawn from Cooper V.S. et al., *Nature* 407: 736–739. © 2000 Macmillan, www.nature.com; 18.5C, redrawn from Lenski R.E. et al., *Proc. Natl. Acad. Sci.* 91: 6608–6618, © National Academy of Sciences, U.S.A.; 18.5D, redrawn from Cooper V.S. et al., *J. Bacteriol.* 183: 2834–2841, © 2001 American Society for Microbiology