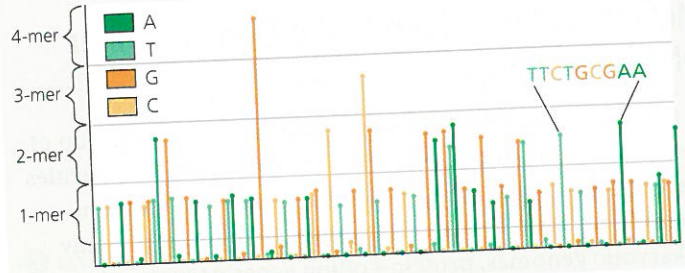
▼ Figure 20.4 **Research Method**

Next-Generation Sequencing

Application In current next-generation sequencing techniques, each fragment is 400–1,000 nucleotides long; by sequencing the fragments in parallel, 700–900 million nucleotides can be sequenced in 10 hours.

Technique See numbered steps and diagrams.

Results Each of the 2,000,000 wells in the multiwell plate, which holds a different fragment, yields a different sequence. The results for one fragment are shown below as a "flow-gram." The sequences of the entire set of fragments are analyzed using computer software, which "stitches" them together into a whole sequence—here, an entire genome.



INTERPRET THE DATA *If the template strand has two or more identical nucleotides in a row, their complementary nucleotides will be added one after the other in the same flow step. How are two or more of the same nucleotide (in a row) detected in the flow-gram? (See sample on the right.) Write out the sequence of the first 25 nucleotides in the flow-gram above, starting from the left. (Ignore the very short lines.)*