

COMPOSITIONS, SYSTEMS, AND METHODS FOR SEQUENCING POLYNUCLEOTIDES USING TETHERS ANCHORED TO POLYMERASES ADJACENT TO NANOPORES

Abstract

A composition includes a nanopore including first and second sides and an aperture, nucleotides each including an elongated tag, and a first polynucleotide that is complementary to a second polynucleotide. A polymerase can be disposed adjacent to the first side of the nanopore and configured to add nucleotides to the first polynucleotide based on a sequence of the second polynucleotide. A permanent tether can include a head region anchored to the polymerase, a tail region, and an elongated body disposed therebetween that occurs in the aperture of the nanopore. A first moiety can be disposed on the elongated body that binds to the elongated tag of a first nucleotide upon which the polymerase is acting. A reporter region can be disposed on the elongated body that indicates when the first nucleotide is complementary or is not complementary to a next nucleotide in the sequence of the second polynucleotide.

Fig. 1A