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Surface Hopping and Sliding of Single DNA Chains under Electric Field[1] BENXIN JING, JIANG ZHAO, Institute of Chemistry, Chinese Academy of Sciences, Beijing, China — The motion of non-adsorbing DNA chains under electric field at solid-liquid interfaces was investigated by single molecule fluorescence microscopy at the total internal reflection geometry (TIRF). In-situ observation discovered that the motion of single non-adsorbing lamda-DNA chains was hopping-and-sliding-like along the surface. By varying the surface chemistry of the solid substrates, from the negative-charged hydroxyl group-rich surface to positive-charged amino group-rich surface, as well as hydrophobic surfaces, the dependence of DNA mobility on the surface-DNA interaction was studied. The results show that a well-defined dependence of the mobility of DNA on the surface polarity with respect to DNA itself. The study on different surfaces such as hydroxyl, amide, amino, and methyl-group rich surface show a sequence of DNA mobility of hydroxyl > amide> amino. The mobility of DNA on methyl terminated surface was found to be similar to that in amino surface.

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