학술상2

MICROSECOND DYNAMICS OF DNA AND IMMUNOGLOBULINS MEASURED WITH LONG-LIFETIME METAL-LIGAND COMPLEXES AND A BLUE LIGHT-EMITTING DIODE

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We extended the measurable time scale of dynamics of DNA and immunoglobulins to microsecond using long-lifetime metal-ligand complexes (MLCs). Long-lifetime MLCs are very photostable probes which possess favorable photophysical properties including long lifetime, high quantum yield, large Stokes' shift, and highly polarized emission. [Ru(1,10-phenanthroline)2(dipyrido[3,2-a:2,3-c]phenazine)]2+ (RuPD) and [Ru(2,2-bipyridine)2(4,4-dicarboxy-2,2-bipyridine)]2+ (RuBDc) were the probes for pBluscript II SK(+) phagemids (pBS) and immunoglobulins, respectively. We measured the intensity and anisotropy decays of RuPD intercalated into supercoiled and linear pBS and of RuBDc conjugated to IgG and IgM using frequency-domain (FD) fluorometry with a blue light-emitting diode (LED) as the modulated light source. Direct electronic modulation of LEDs eliminates the expensive and cumbersome Pockels cells in most FD instruments. The slow and fast rotational correlation times of RuPD intercalated into supercoiled and linear pBS appear to be consistent with the bending and torsional motions of the phagemids, respectively. The slow rotational correlation times of RuBDc conjugated to IgG and IgM reflect the overall rotational diffusion of IgG and IgM.

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