TUNING FÖRESTER RESONANCE ENERGY TRANSFER (FRET) IN DNA-FLUOROPHORE CONSTRUCTS

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According to Förester's equations, the efficiency (E_{FRET}) of resonance energy transfer between fluorophores is governed by three factors: separation distance, relative orientation of transition dipole moments, and the spectral overlap integral. We've designed an ideal architecture for controlling each of these parameters by covalently linking FRET fluorophore pairs into complementary DNA helices. Steady-state absorption and emission spectroscopies are used to determine E_{FRET} in a range of environments, while time-resolved techniques are used to reveal any decreases in FRET due to competing electronic relaxation pathways.