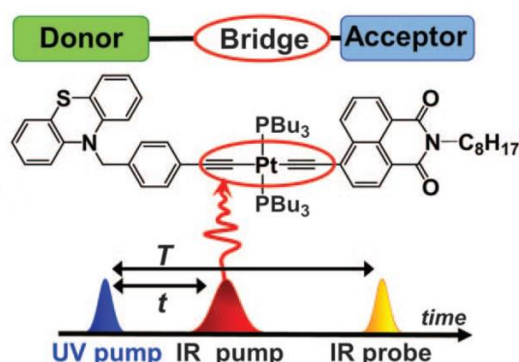


# Some Light Chemistry

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Photon driven electron transfer (ET) reactions are the most fundamental of all chemical reactions and lead to a wide range of chemical and biological change, including vision, photosynthesis and artificial light harvesting for our energy needs. Using an ultrafast electronic-vibrational pulse-sequence, we show that the outcome of a light-induced electron transfer reaction can be radically altered by mode-specific infrared (IR) excitation of vibrations which are coupled to the ET pathway. Following  $\sim 40$  fs UV/Vis population of electronic excited state(s), the IR pulse ( $\sim$  bandwidth  $12\text{ cm}^{-1}$ ) provides targeted excitation of intramolecular vibrations in a covalently bound donor-bridge-acceptor (DBA) molecular triad. The DBA triad, Fig 1, comprises a platinum(II)-trans-acetylide motif attached to the electron donor phenothiazine (PTZ), and the electron acceptor, naphthalene-monoimide.



**Fig.1:** Molecular structure of Donor-Bridge-Acceptor (DBA) PTZ-CH<sub>2</sub>-Ph-C≡C-Pt-C≡C-NAP triad and representation of ultrafast laser pulse sequence,  $vis_{pump}$ ,  $IR_{pump}$  and  $IR_{probe}$ .

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## Reference:

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