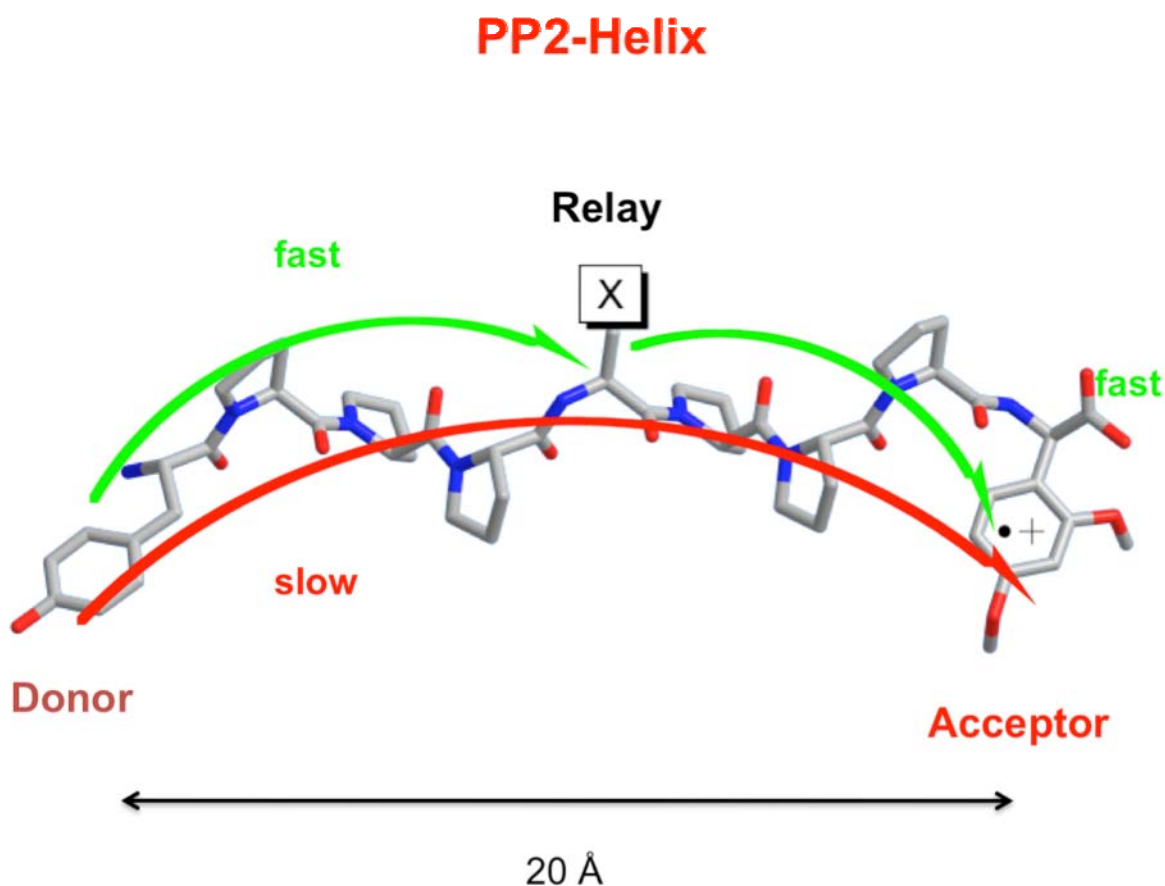


Electron Transfer through Peptides: Consequences for Enzymatic Reactions

Bernd Giese

Department of Chemistry, University of Fribourg, Chemin du Musée 9
CH-1700 Fribourg, Switzerland
E-mail: bernd.giese@unifr.ch

Long-range electron transfer (ET) through proteins is a fundamental reaction in living organisms, playing a role in energy-conversion processes like photosynthesis and respiration as well as in enzymatic reactions. The mechanism of these ET processes over long distances is a matter of controversy. We have developed a new assay that allows the measurement of ET rates and ET efficiencies.



The results are: 1) Heteroaromatic and S-containing amino acids act as relay amino acids that induce ET by a hopping mechanism. 2) Charges dramatically influence ET

rates. 3) The direction of the ET process and the sec. structure of the peptide plays an important role. 4) Rates increase with increase of the driving force and decrease with increasing donor/acceptor distance.

The consequences for enzymatic reactions and nanoelectronic applications will be discussed.

Latest publication giving further literature:

Gao, J.; Müller, P.; Wang, M.; Eckhardt, S.; Lauz, M.; Fromm, K. M.; Giese, B.
Angew. Chem. **2011**, *50*, 1926.