



**23<sup>rd</sup> February 2017 - 10:00**  
Building 99, Seminar Room I+II (EG)

## **Yoni Toker**

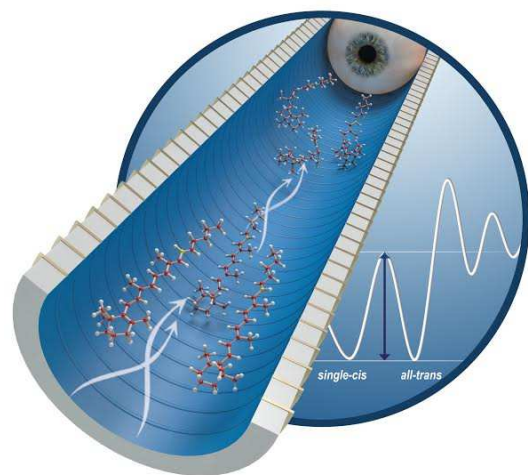
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### **Watching Isolated Molecules Change Their Shape**

Ion mobility to differentiate and select different conformations of an isolated molecular ion.

Recently it has been shown that using two stages of ion mobility it is possible to measure isomerizations - structural changes in isolated molecules. Moreover, it is possible to measure the relative energies of different isomers, and to deduce the barrier energy for each isomerization pathway.

We have applied the technique to one of the most biologically important cases, that of the retinal protonated Schiff base (RPSB). RPSB is the chromophore which acts as a photon detector in every known form of animal vision. The primary step in vision is photoisomerization of the RPSB, which then activates the surrounding protein. We have studied the barrier energies for isomerizations of the RPSB and have shown them to be significantly lower than within the protein. We have also compared different derivatives of the chromophore and shown that slight changes to the structure of the chromophore, can dramatically effects its energy landscape.



#### **References**

"Measurement of the stabilities of isolated retinal chromophores" L. Musbat, M. Nihamkin, Y. Toker, J. M. Dilger, D. R. Fuller, T. J. El-Baba, D. E. Clemmer, S. Sarkar, L. Kronik, A. Hirshfeld, N. Friedman, and M. Sheves, Phys. Rev. E 95 (2017), 012406.

"Direct Measurement of the Isomerization Barrier of the Isolated Retinal Chromophore", J. Dilger, L. Musbat, M. Sheves, A. B. Bochenkova, D. E. Clemmer, Y. Toker, Ang. Chemie Int. Ed. 127 (2015), 4830-4834.

Host: Melanie Schnell - CFEL Molecular Physics seminar