Observing electron dynamics in matter on its natural time scale requires attosecond technology. We show how isolated attosecond pulses can be used in combination with phase-stable infrared/ultraviolet pulses to track ultrafast charge dynamics in bio-relevant molecules such as amino acids and nucleobases as well as in nanoparticles. Our results open new important perspectives for a future understanding of the role of the electronic motion in the photochemistry of complex molecules.