Tunneling electrons from a low temperature (5 Kelvin) scanning tunneling microscope (STM) were used to control, through resonant electronic excitation, the molecular dynamics of an individual biphenyl molecule adsorbed on a Si(100) surface. Different reversible molecular movements were selectively activated by tuning the electron energy and by selecting precise locations for the excitation inside the molecule. Both the spatial selectivity and energy dependence of the electronic control are supported by spectroscopic measurements with the STM. These experiments demonstrate the feasibility of controlling the molecular dynamics of a single molecule through the localization of the electronic excitation inside the molecule.