

We report on the use of intense 80 MHz/90 MHz femtosecond laser pulses at sub-3 nJ pulse energy for nanoprocessing of DNA molecules, living cells and ocular tissue. FWHM cut sizes of less than 100 nm have been obtained at 800 nm laser wavelength. The nanoprocessing tool was used to realize intracellular chromosome dissection, optical knocking out of nanoparticle labeled genomic regions and refractive surgery. Using picojoule pulse energies we performed multiphoton tomography of human skin. In particular we were able to image deep tissue areas of pigmented human skin disorders. Multiphoton systems have the potential to provide tools for nanosurgery and high-resolution diagnostics of skin cancer.