



Figure ESI 1: fs-laser ablation of a thin tissue section from cerebellar porcine brain monitored by CARS microscopy at  $2850\text{ cm}^{-1}$  A: porcine brain tissue monitored by CARS microscopy at  $2850\text{ cm}^{-1}$  before fs-Laser ablation. B: porcine brain tissue monitored by CARS microscopy at  $2850\text{ cm}^{-1}$  after fs-Laser ablation (CARS-Laser: Pump 795 nm, Stokes 1032nm, 65 mW at the sample, 1 MHz repetition rate, A: image size 1024x1024 pixel, 930 $\mu\text{m}$ x930 $\mu\text{m}$ , 4 $\mu\text{s}$  pixel dwell time, B: image size 970x970 pixel, 644 $\mu\text{m}$ x644 $\mu\text{m}$  1 $\mu\text{s}$  pixel dwell time, fs-ablation laser: 500  $\mu\text{W}$ , 800nm, 35 fs, 1 kHz).