By combining femtosecond laserpulse technologies with laser induced breakdown spectroscopy (LIBS) we developed a new element-specific microscopy technique for in-vivo, in-situ biomedical applications. High spatial resolution in the femto- to attoliter range in combination with high element-specific sensitivity was realized. We demonstrated the spectrochemical analysis of bound calcium in the epidermal cell walls of young sunflower seedlings [1].

Currently, we scan the surface morphology of the biological specimen using confocal techniques. This information will be used in our combined micro- and nano material processing platform for 3-D depth profiling of trace elements. This new microscopy technique will be discussed, first experimental results will be presented and the current status of the instrument will be reported.