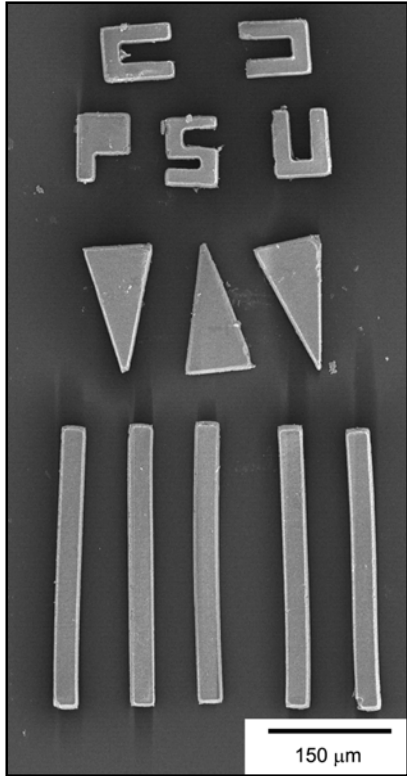
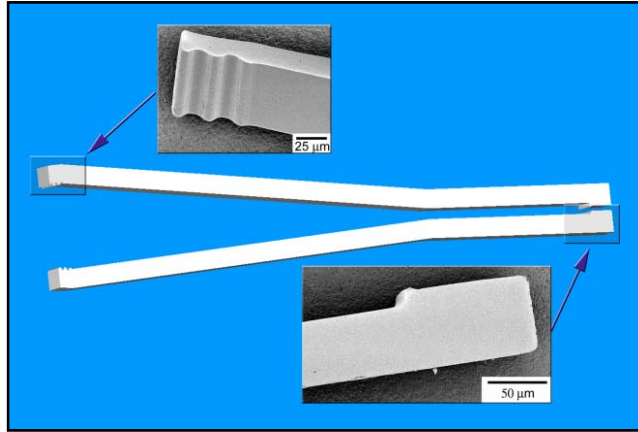


Micron-scale Ceramic Instruments

Greg Hayes, Nick Antolino, James Adair, Mary Frecker,
Penn State University, University Park



sintered mechanical test bars and triangle parts



Generation 1 ceramic tweezers with SEM of the gripping and foot ends



Next generation surgical tweezing/cutting instruments using multilayer molds

Micron-scale ceramic parts were fabricated by infiltrating high aspect ratio SU8 photoresist molds patterned on refractory substrates with vitra stabilized zirconia particles. The infiltrated structures are fired to remove the mold and sinter the ceramic, which leaves free standing parts that have mechanical properties comparable to bulk ceramics.

These ceramic parts are being investigated for use in a variety of applications including surgical instruments.

Combining microfabrication and oxide processing techniques yields new micron-scale surgical instruments