Cantilever-like sensors for use in bio-medical applications

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Small mechanical structures such as cantilevers, bridges and lids can be used as sensitive and label free sensors. A biochemical reaction at the surface of the structure can be monitored as a bending, due to a change in surface stress. Minute temperature changes can be registered by exploring the bimorph effect. Furthermore, mass detection can be achieved by using resonating structures and monitor how the resonant frequency changes as a function of the added mass. In order to obtain high sensitivity the structures need to have micrometer and sometimes nanometer dimensions. They are fabricated by cleanroom processing using either silicon or polymer based materials. We will present examples of our recent advances in the field of sensor development including results on the on-line detection of DNA proteins and nano-particles. Also the strength of combining several independent miniaturized sensors will be discussed and illustrated for the use in explosives detection.