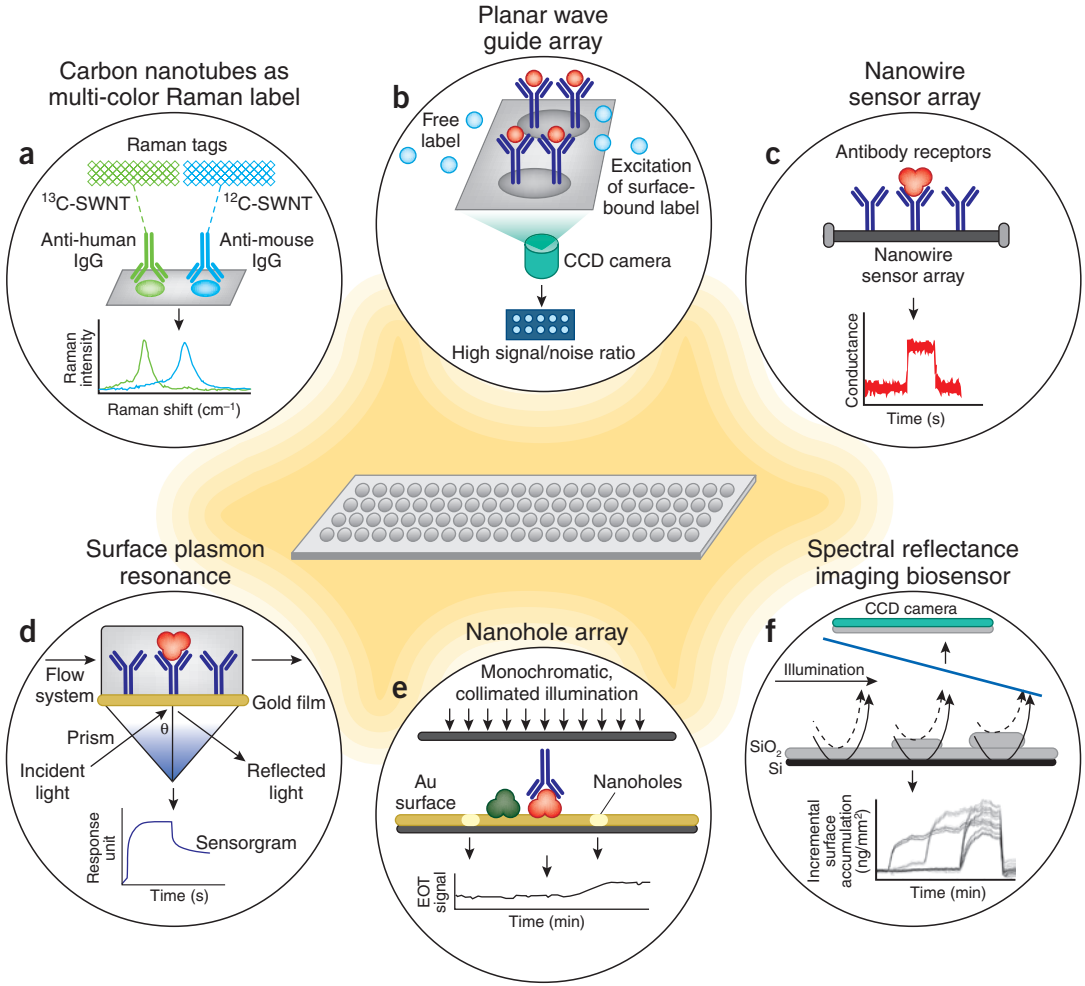

Figure 1 Sensitive detection techniques for protein microarrays. (**a**) Raman labels based on multicolor ^{12}C and ^{13}C SWNT tags for multiplexed protein detection (modified from Chen *et al.*[1]). The inset shows Raman scattering spectra for multiplexed protein detection. (**b**) A planar waveguide array system for fluorescence imaging (modified from ref. 5). All molecules of the microarray are excited simultaneously with a laser light, and only surface-confined fluorescence labels are selectively excited for emission. The inset shows the higher signal-to-background ratio achieved using this technique. (**c**) In a nanowire sensor array, a protein binds specifically to its receptor on the nanowire, producing a conductance change (modified from ref. 6). The inset shows conductance versus time data recorded for a binding event. (**d**) SPR measures changes in the refractive index very close to a sensor surface. The binding between a ligand immobilized on the sensor surface and an analyte in solution results in a change in the refractive index, which is monitored in real time. The inset, known as a sensorgram, shows changes in the resonance signal as a function of time. (**e**) Detection of real-time multiple binding events by monitoring the intensity of extraordinary optical transmission (EOT) through nanohole sensing arrays (modified from ref. 9). The inset shows binding events between the sensing arrays and the antibody. (**f**) Spectral reflectance imaging biosensor based on interference of light reflected from an SiO_2 surface (modified from ref. 11). Increases in optical path length differences caused by biomolecular binding are measured. The inset shows the binding kinetics of various antigens to their respective antibodies.