CLAIMS

1. An assay cartridge for detecting a target component in a fluid, the assay cartridge including an optical element comprising:

a light pathway comprising an input surface, a reflective surface and an output surface configured such that light entering the input surface undergoes total internal reflection at the reflective surface to create an evanescent field ~~to enable light to enter, reflect and create an evanescent field in the vicinity of the reflective surface~~ and exits the element from the output surface;

a plurality of capture components directly deposited ~~on the reflective surface in the vicinity of the evanescent field~~onto a pre-determined area of the reflective surface; and

a transmission surface configured to enable emissions from the evanescent field to exit the element;

wherein the assay cartridge is a single use cartridge.

~~2. The assay cartridge according to claim 1, wherein the single use nature of the cartridge is implemented through physical constraints.~~

~~3~~2. The assay cartridge according to claim ~~2~~1, further comprising a one way clip to ensure that the cartridge is single use.

~~4. The assay cartridge according to claim 1, wherein the single use nature of the cartridge is implemented through chemical constraints.~~

~~5~~3. The assay cartridge according to claim ~~4~~1, further comprising an irreversible spot to ensure that the cartridge is single use.

~~6~~4. The assay cartridge according to claim 1, wherein the single use nature of the cartridge is implemented through data management.

~~7.~~5 The assay cartridge according to claim ~~6~~4, further comprising an identity tag to ensure that the cartridge is single use.

~~8~~6. The assay cartridge according to claim 5~~7~~, wherein the identity tag is printed onto the cartridge.

~~9~~7. The assay cartridge according to claim ~~7~~ 5 or claim ~~8~~6, wherein the identity tag is selected from a group including a barcode or a QR code, or wherein the identity tag is an RFID tag.

~~10. The assay cartridge according to claim 7, wherein the identity tag is an RFID tag.~~

~~11~~8. The assay cartridge according to any one of claims 1 to ~~10~~7, wherein the emissions from the evanescent field are Mie, Raman or Rayleigh scattering.

~~12~~9. The assay cartridge according to any one of claims 1 to ~~11~~8, wherein at least one of the capture components is DNA or an antibody or a protein.

~~13. The assay cartridge according to any one of claims 1 to 12, wherein the fluid is saliva.~~

~~14~~10. A method of fabricating an array of assay cartridges each cartridge being an assay cartridge according to any one of claims 1 to ~~13~~9, the method comprising the steps of:

fabricating a plurality of optical elements through the steps of:

heating a preform to a temperature equal to or exceeding the glass transition temperature of the preform;

drawing the preform into an elongate strand; and

dividing the strand into a plurality of optical elements;

mounting at least one optical element in each assay cartridge; and

depositing at least one capture component directly on the reflective surface of each optical element.

~~15~~11. The method according to claim ~~14~~10, wherein the dividing of the strand into a plurality of optical elements involves cleaving the strand.

~~16~~12. The method according to claim ~~14~~11, wherein the dividing of the strand into a plurality of optical elements involves processing the strand with a laser.

~~17~~13. The method according to claim ~~14~~10, ~~15~~ 11 or ~~16~~12, wherein the dividing of the strand occurs perpendicular to the direction in which the preform is drawn.

~~18~~14. The method according to claim ~~15~~11, wherein the cleaving step takes place alternately from each side of the strand so that each optical element has a trapezoidal cross section.

~~19. The method according to any one of claims 14 to 18, wherein the assay cartridge includes a plurality of optical elements.~~

~~20~~15. The method according to any one of claims ~~14~~ 10 to ~~19~~14, wherein the depositing of the capture component occurs by printing.