CLAIMS

1. An interposer comprising:

a base layer having a first surface and a second surface opposite the first surface, the base layer comprising black polyethylene terephthalate (PET);

a first adhesive layer disposed on the first surface of the base layer, the first adhesive layer comprising acrylic adhesive;

a second adhesive layer disposed on the second surface of the base layer, the second adhesive layer comprising acrylic adhesive; and

a plurality of microfluidic channels extending through each of the base layer, the first adhesive layer, and the second adhesive layer.

2. The interposer of claim 1, wherein a total thickness of the base layer, first adhesive layer, and second adhesive layer is in a range of about 1 to about 200 microns.

3. The interposer of claim 1 or 2, wherein the base layer has a thickness in a range of about 10 to about 100 microns, and each of the first adhesive layer and the second adhesive layer has a thickness in a range of about 5 to about 50 microns.

4. The interposer of any of the claims 1-3 wherein each of the first and second adhesive layers has an auto-fluorescence in response to a 532 nm excitation wavelength of less than about 0.25 a.u. relative to a 532 nm fluorescence standard, and/or wherein each of the first and second adhesive layers has an auto-fluorescence in response to a 635 nm excitation wavelength of less than about 0.15 a.u. relative to a 635 nm fluorescence standard.

5. The interposer of any of the preceding claims wherein the base layer comprises at least about 50% black PET, or wherein the base layer consists essentially of black PET.

6. The interposer of any of the preceding claims wherein each of the first and second adhesive layers comprises at least about 5% acrylic adhesive, or

wherein each of the first and second adhesive layers consists essentially of acrylic adhesive.

7. The interposer according to any of the preceding claims further comprising a first release liner disposed on the first adhesive layer, and a second release liner disposed on the second adhesive layer.

8. The interposer of claim 7, wherein the plurality of microfluitic channels extends through the second release liner, but not through the first release liner.

9. The interposer of claim 8:

- wherein the first release liner has a thickness in a range of about 50 to about 300 microns; and

  the second release liner has a thickness in a range of about 25 to about 50 microns; and/or
- wherein the first release liner is at least substantially optically opaque and the second release liner is at least substantially optically transparent.

10. A flow cell comprising:

a first substrate;

a second substrate; and

the interposer of any of the preceding claims, disposed between the first substrate and the second substrate,

wherein the first adhesive layer bonds the first surface of the base layer to a surface of the first substrate, and the second adhesive layer bonds the second surface of the base layer to a surface of the second substrate.

11. The flow cell of claim 10 wherein each of the first and second substrates comprises glass, and wherein a bond between each of the first and second adhesive layers and the respective surfaces of the first and second substrates is adapted to withstand a shear stress of greater than about 50 N/cm^2 and a peel force of greater than about 1 N/cm.

12. The flow cell of claim 10 or 11 wherein each of the first and second substrates comprises a resin layer that is less than about one micron thick and includes the surface that is bonded to the respective first and second adhesive layers, and wherein a bond between each of the resin layers and the respective first and second adhesive layers is adapted to withstand a shear stress of greater than about 50 N/cm^2 and a peel force of greater than about 1 N/cm.

13. The flow cell of any of the claims 10-12 wherein:

a plurality of wells is imprinted in the resin layer of at least one of the first substrate or the second substrate,

a biological probe is disposed in each of the wells, and

the microfluidic channels of the interposer are configured to deliver a fluid to the plurality of wells.

14. A method comprising:

forming an interposer comprising:

a base layer having a first surface and a second surface opposite the first surface, the base layer comprising black polyethylene terephthalate (PET),

a first adhesive layer disposed on the first surface of the base layer, the first adhesive layer comprising acrylic adhesive,

a second adhesive layer disposed on the second surface of the base layer, the second adhesive layer comprising acrylic adhesive; and

forming microfluidic channels through at least the base layer, the first adhesive layer, and the second adhesive layer.

15. The method of claim 14 wherein the forming microfluidic channels involves using a CO_2 laser, preferably wherein the CO_2 laser has a wavelength in a range of about 5,000 nm to about 15,000 nm, and a beam size in a range of about 50 to about 150 μm.

16. The method of claim 15 wherein:

the interposer further comprises:

a first release liner disposed on the first adhesive layer, and

a second release liner disposed on the second adhesive layer; and

in the step of forming the microfluidic channels, the microfluidic channels are further formed through the second release liner using the CO_2 laser, but are not formed through the first release liner.