# Spiropyran Modified Microfluidic Chip Channels for Photonically Controlled Sensor Array Detection of Metal Ions

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Microfluidic chips are particularly attractive for analytical purposes because they provide a convenient small platform for rapid analysis and detection.[1] Furthermore, spiropyrans dyes can be used as photonically controlled, self-indicating molecular recognition agents for the fabrication of sensors.[2] Here, we show how through integrating the beneficial characteristics of microfluidic devices and spiropyrans dyes, a simple and very innovative chip for on-line metal ion sensor array can be realised.

The chip (4x3cm) consists of four independent 180μm depth, polydimethylsiloxane (PDMS) channels. 1'-(3-Carboxypropyl)-3,3'-dimethyl-6-nitrospiro-[2*H*-1]-benzopyran-2,2'-indoline is covalently immobilised on the ozone plasma activated PDMS microchannel surfaces.

Upon exposure to UV light, the transparent PDMS channels change to light purple colour because the spiropyran molecules of the surface undergo a heterocyclic ring cleavage that result in the formation of the highly conjugated merocyanine form. When stock solutions of several ion metals ($Ca^{2+}$,$Zn^{2+}$,$Hg^{2+}$,$Cu^{2+}$) are pumped independently through the four channels, different optical responses were observed for each metal.

1-L.Basabe-Desmonts *et al. Anal.Bioanal.Chem.*(**2008**)390:307–315.
2-R.J.Byrne *et al. J.Mat.Chem.*(**2006**)16:1332-1337.