

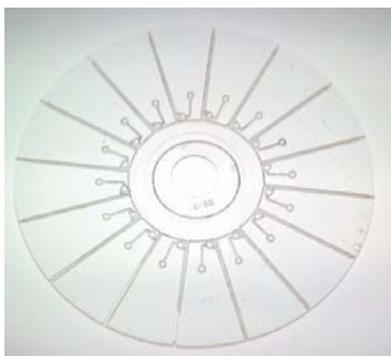
Separations-on-a-chip? Scientists at Liverpool Put a Different Spin on Things!

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We have all read about lab-on-a-chip (LOC) devices (or if we hadn't already, we will now after reading this issue of Chromatography Today!) and how they may offer the possibility of miniaturising analytical instruments. However one thing continues to let them down and that is how do you move fluids around the chips? The pumping mechanisms within these devices can be very complex and difficult to implement reproducibly as it commonly uses external pumps or high voltages.

Scientists at the University of Liverpool are developing a new innovative simple approach to this problem in developing a lab-on-a-CD where liquids are moved around a CD by centrifugal force that is generated when the disc spins, and so eliminating the need for internal moving parts and voltage potentials like those needed for many other LOCs.

The first CD based products from the Liverpool research group of Professor Peter Myers is a chromatographic CD that comprises of 16 high performance liquid chromatography columns (below).

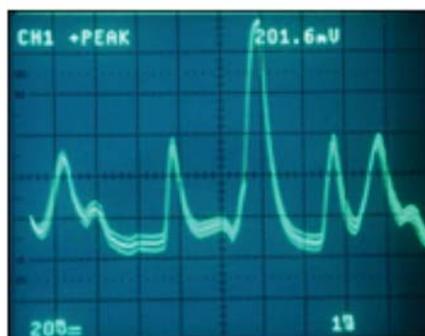


By simple hardware and software modifications to a conventional music CD

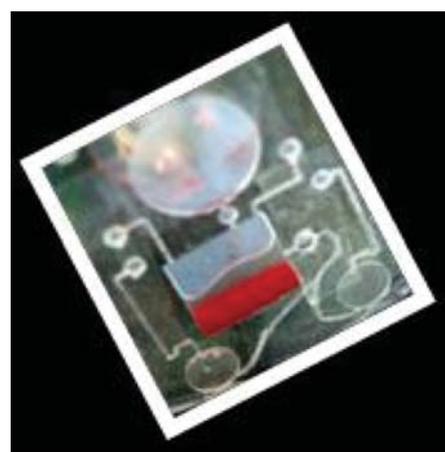
player a small and portable Liquid Chromatograph has been developed. (below)



The sample is moved through the column using centripetal force and is detected using the standard CD laser detection which identifies compounds leaving the column as 'errors'. These error counts can be converted into something like a chromatogram through digitisation.



The group is now developing the lab-on-a-CD for clinical analysers. In the clinical area blood tests are the most commonly-used diagnostic method as blood analyses provide definitive information of medical conditions of patients. Traditional blood tests are conducted using large-scale blood analysers, which are equipped in centralised laboratories and



operated by highly trained personnel. Comprehensive blood analyses including sample collection, preparation and detection have not become fully point-of-care yet. The goal of the Liverpool research POC is to provide low-cost, easy-to-use, field-rugged solutions for on-site, short-turnaround-time diagnosis using lab-on-a-CD technology. The image above is a section of the new Lab-on-a-CD disc to separate blood into its plasma and platelets. The image below shows blood separated into plasma and platelets.

