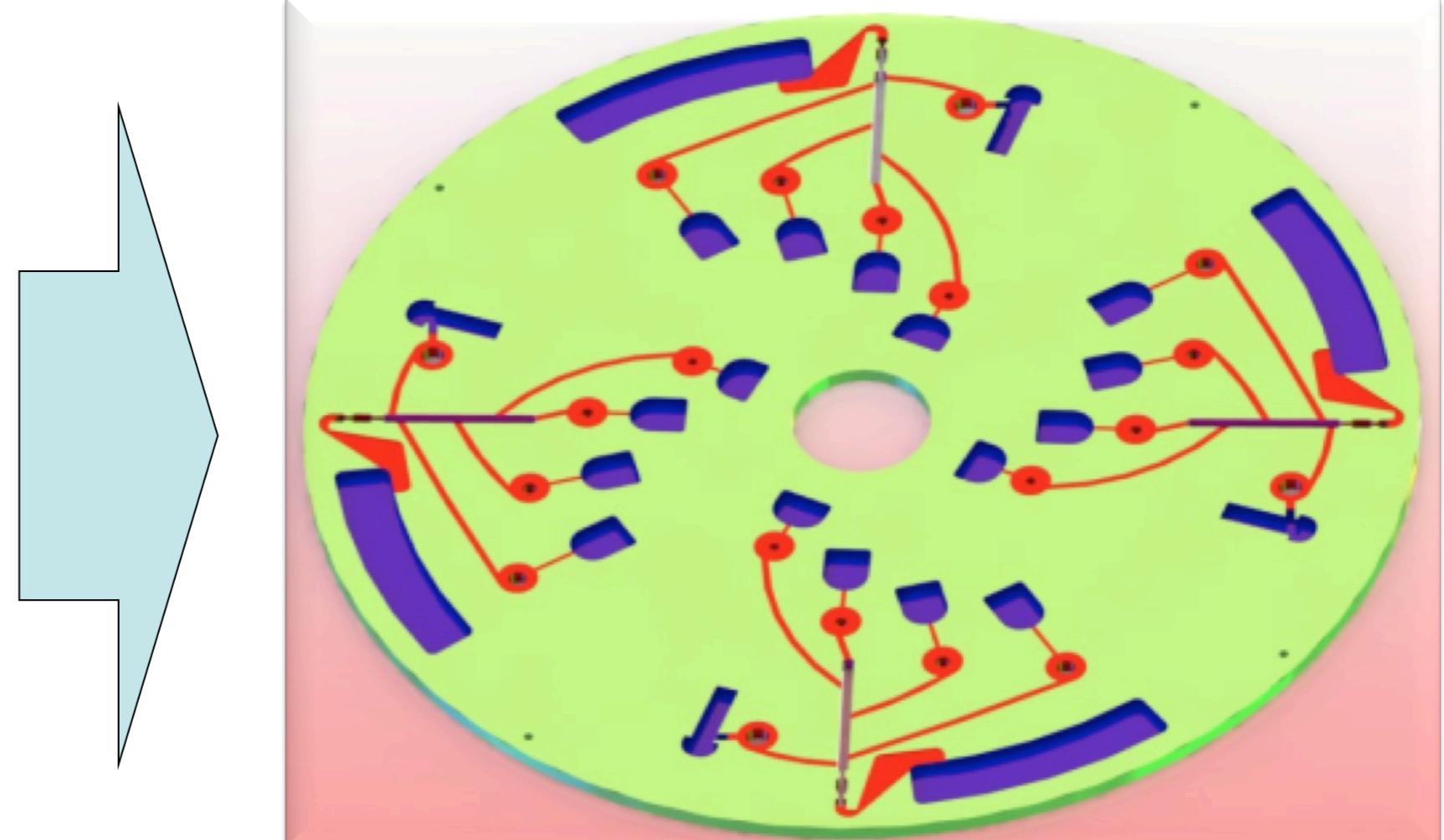


CENTRIFUGAL MICROFLUIDICS ON A HAND CRANKED SPINSTAND



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We can do microfluidic tests by spinning a disc which is the same size as a DVD! The centrifugal force acts on the liquid just like it acts on a person on a Merry-go-Round!



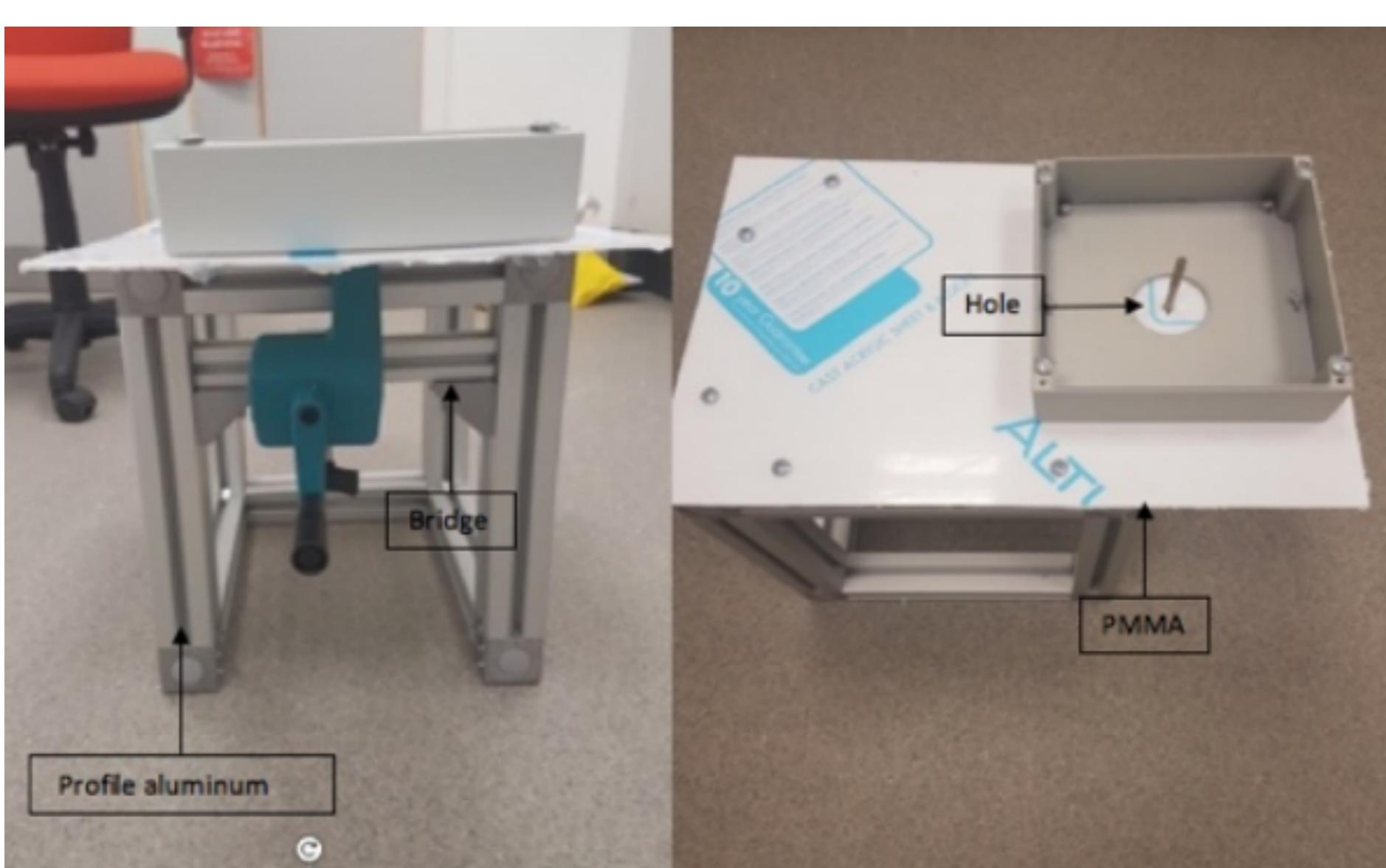
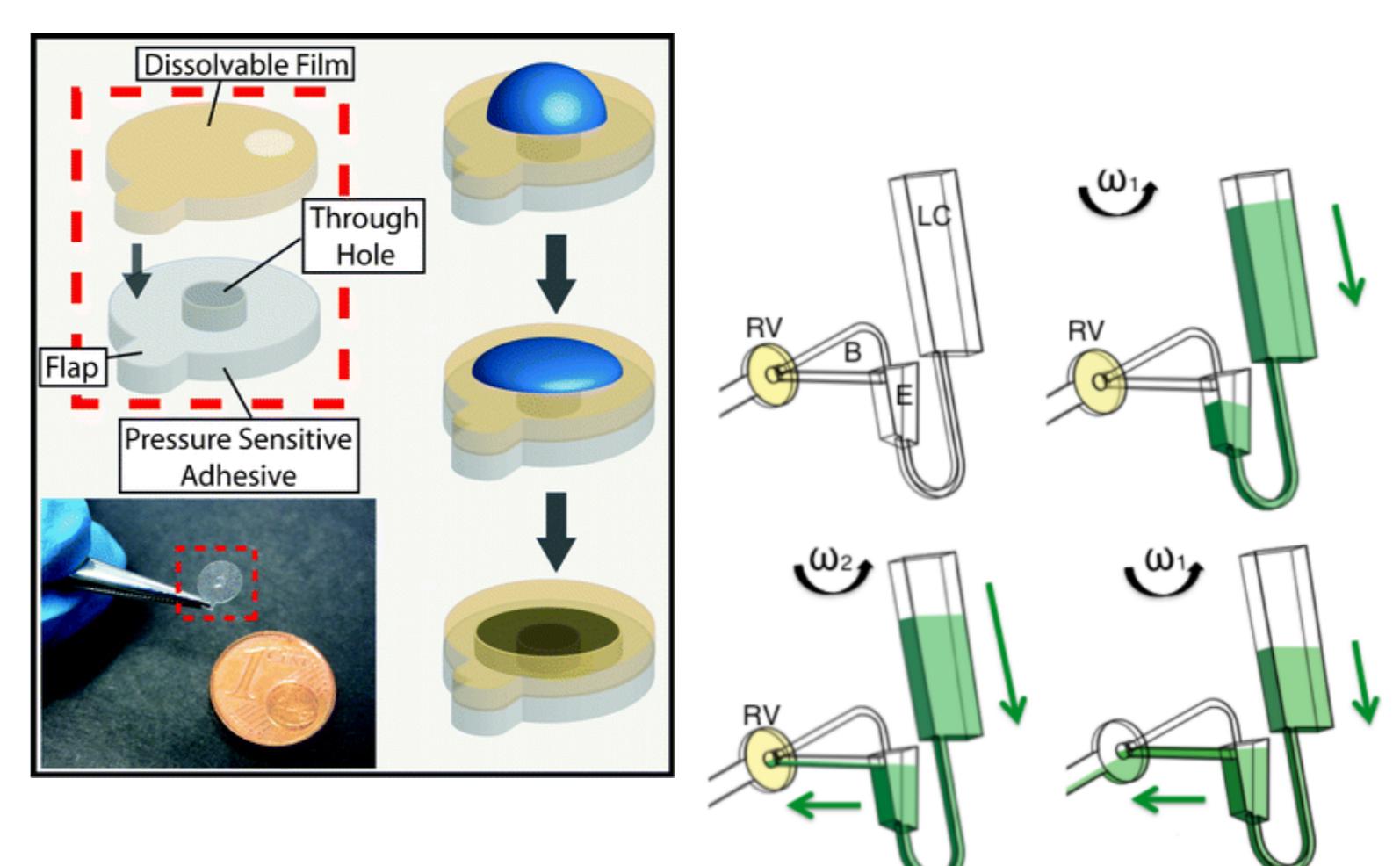
WHY?

- Normal pumps can be expensive and difficult to connect Lab-on-a-Chip
- Spinning the disc lets us move the liquid without a pump
- So its really good for applications outside the lab like environmental monitoring and food testing!

But a big problem is that all the liquid on the disc should be pumped outwards at the same time. So we need to control this. This is difficult on the spinning disc because its moving so fast but we have some clever valves to help us do this

SO HOW DO WE DO IT?

- We block our channels with dissolvable film just like the ones used for dishwasher tablets!
- We use pockets of trapped air to stop reagents coming in contact with the dissolvable film.
- Just like a balloon, the bigger the air pocket the easier it is to squeeze. This is called Boyle's Law
- By increasing the spin speed we can squeeze the air and so wet the film! The bigger the pocket the lower the spin speed needed!



COME AND GIVE IT A TRY

- We have a hand powered 'spin-stand' which can spin the discs!
- Each turn of the hand-crank gives 30 turns of the disc
- We have some discs for you to test with us
 - Disc 1 works just by spinning the handle.
 - Disc 2 depends on the spin speed – you need to carefully increase the speed to open the valves in the correct order
- So how will you see something turning 30 times a second?
 - We have a Camera with a synchronised flash called a Strobe! So look at the PC screen and see what's happening!