Building functionality into the antibody supply chain

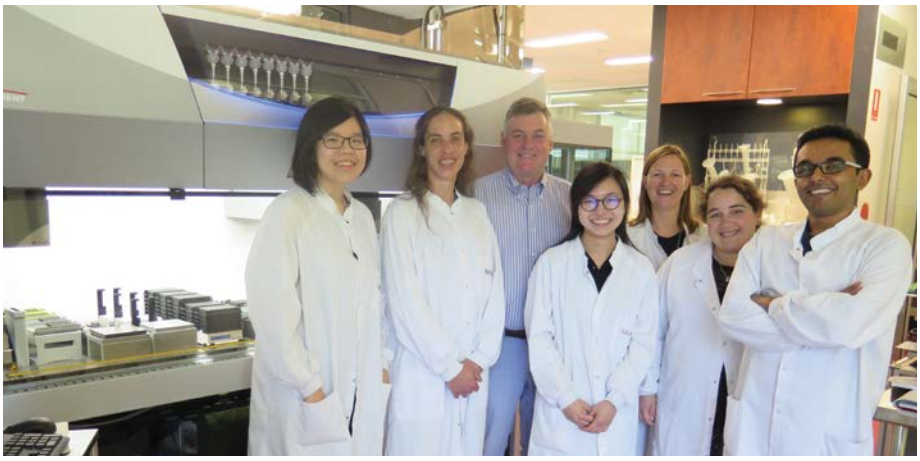
The Monash Antibody Technologies Facility (MATF) in Victoria, Australia, has added a new dimension to its high throughput service, offering screening for antibody functionality. This time-consuming phase is crucial for many projects, and can now be outsourced to MATF, where comprehensive and flexible automation completes testing in a fraction of the time.

Section of a mouse testis stained with RBM5 antibody (red), binding partner (green) and nuclear stain (blue) (Courtesy of Moira O'Bryan)

MONASH University

MATF is a core facility based at Monash University with a global reputation for producing high quality, high affinity monoclonal antibodies for biomedical research projects around the world. Approximately half of the MATF's projects stem from the medical and biochemistry faculties at the university, with the remainder from academic institutes, large pharmaceutical and small biotech companies further afield. Dr Caroline Laverty, Head of Robotics and Manager at MATF, explained: "Our core business is monoclonal antibodies. We are quite unique with regard to our high throughput capabilities, but our important differentiating factor is delivery of a high quality product. We are an ISO 9001 certified facility, and have a great deal of combined knowledge in the antibody field, including pharmaceutical industrial experience from myself and the facility's director Professor Mark Sleeman. Our projects are highly varied, because they all depend on customer-focused, versatile screening strategies that deliver exactly what the customer wants. We have tried-and-tested core methodologies which we add specific details to, according to what is required – How many antibodies? What sort of antigen? How many screening samples? What is the intended end use? – which is where we build in the flexibility."

"Our robotic systems are very much integrated into how we find antibodies, and how we screen them. We also operate a smaller liquid handling facility – RoboCore™ – and automation makes the job easier for us and gives us the power to be diverse. For every project, we are able to generate far higher numbers of hybridomas – and hence a bigger pool of antibodies for potential screening – than would be possible manually. Most of the time we're effectively looking for a needle in a haystack. The robotics we have mean that we can start with a really big haystack, and still effectively screen it to find the needle. Automation also gives our staff 'headspace' to think about the science; it reduces the amount of staff needed in the lab. We looked into this a couple of years ago, and without our automation we would need upwards of 20 people to achieve the same output – that's five times our current head count."



Members of the MATF RoboCore team

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Until recently, MATF has supplied its customers with antibodies that have been tested by microarray and ELISA to confirm that they bind to the corresponding antigen, at which point the customer has screened them in house for functionality. This is particularly true for the growing field of therapeutic antibodies. However, this is a very time-consuming part of the process which often takes months. For this reason, and at the request of customers, MATF has invested in a new Fluent® Laboratory Automation Solution that can complement this phase of screening. Caroline explained that the new system will enable them to scale up functional cell-based assays developed internally or by customers to screen hybridomas. "We will be able to tell them at an early stage that the antibodies not only bind, but that they are also functional, potentially saving the customer months, if not years, of work."

Caroline's background is in the application of automation to varied laboratory procedures, and she said of the Fluent: "This system is fundamentally different, in ways which are essential when you're trying to deal with so many projects on the go at the same time. The demographic of our customers' projects is quite wide – these antibodies may be for anything from veterinary medicine to medical research and diagnostics – and we expect to be running up to 10 screening campaigns at any one time. The Fluent has been configured to give us maximum flexibility; it is slick, smooth and very easy to teach. The way the deck is configured is ideal for us; we can add or take away modules, carriers or other pieces of equipment very easily. And there are other simple, yet really useful things. For example, if an assay stops halfway through a protocol for any reason, it can find itself in space rather than having to go back to home each time. The 10 Freedom EVOs® we have are brilliant – they're very reliable and robust – but the Fluent is something quite different."

Caroline concluded: "Our relationship with the Tecan team in Australia is really the icing on the cake, and we actively promote this well-built partnership. We rely on the service Tecan provides, because we have an obligation to our customers. We quote timelines and quality and, to achieve that, we need all of our instrumentation to be working all of the time. The back-up and application support are fundamental for our processes, and I don't believe that any automation company other than Tecan can provide us with that level of assurance."

To find out more about Tecan's Fluent Laboratory Automation Solution, visit www.tecan.com/fluent

To learn more about the Monash Antibody Technologies Facility, go to platforms.monash.edu/matf