

# A real winner for multiple sclerosis research

In the last Tecan Journal we announced that Dr Francisco Quintana from the Harvard Medical School had become the first ever winner of the Tecan Detection Award. Dr Quintana's laboratory is using a range of Tecan instruments – including a HS 4800™ Pro hybridization station, a PowerScanner™ and an Infinite® F200 microplate reader – as part of a systems biology approach to studying the role of the immune response in multiple sclerosis.



Dr Francisco Quintana



The HS 4800 Pro allows the Center for Neurologic Diseases to process up to 48 slides per run

The Center for Neurologic Diseases at the Brigham and Women's Hospital, Harvard Medical School, Massachusetts, is a group of multidisciplinary biomedical research laboratories investigating the causes of, and new treatment strategies for, chronic neurological diseases, with an emphasis on multiple sclerosis (MS), Alzheimer's disease and Parkinson's disease.

Focusing on the deregulation of the immune response in MS, Dr Francisco Quintana's laboratory uses a systems biology strategy to explore the signaling pathways affected, combining experimental models and clinical samples to develop a better understanding of the disease. Dr Quintana explained: "MS is a neurological disorder caused by an autoimmune response to the central nervous system (CNS), however, little is currently known about the roles of the innate and the adaptive immune response in different stages of the disease. We are

investigating the signaling mechanisms which control the immune response to discover unique biomarkers which might characterize particular stages of MS, the activity of specific pathogenic mechanisms or indicate who is likely to respond to a given treatment. We are also trying to identify novel therapeutic targets, to develop new drugs to help alleviate patients' symptoms."

"In addition to clinical samples, we use several animal models of MS to study inflammation of the CNS. We have both mouse and zebrafish disease models, and use a variety of *in vitro* techniques to characterize these models and understand the underlying molecular mechanisms for what we observe in the animals. A majority of these studies involve fluorescence- or luminescence-based methods, including enzyme activity assays, gene reporter/gene function assays and ELISAs. To follow these assays we use an Infinite F200 microplate

reader, which is ideally suited to this kind of work. The instrument's multimode capabilities allow us to perform various assay types on a single platform, and we are very happy with its performance."

To support the group's research, Dr Quintana has also established a microarray core facility which develops and runs antigen and reverse phase protein microarrays for a wide range of studies. "We are able to fabricate our own antigen microarrays, using an automated system to spot up to 600 different proteins, peptides or lipids of interest onto slides," Dr Quintana continued. "We then hybridize these with samples from either MS patients or animal models using an HS 4800 Pro hybridization station. The arrays are read with the PowerScanner, and are analyzed by the group's bioinformatician, with the help of Tecan's software. We use these arrays to identify potential biomarkers for MS, elucidate mechanisms of pathogenesis and ascertain which signaling pathways are activated in response to therapeutic interventions. For example,

we use antigen arrays to identify lipids that might be important in the progression of MS."

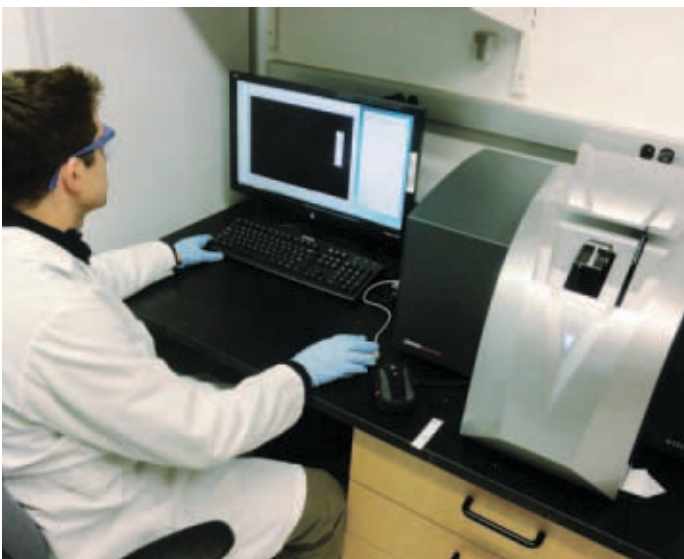
"When we initially set up this facility, we explored systems from a number of different manufacturers, and the service we received from Tecan was outstanding. We were able to test the instruments in our own laboratory, which is a real bonus as it allows you to use the instrument with your own samples, and the Tecan representative was extremely knowledgeable. The HS 4800 Pro was also the only competitively priced hybridization station that allowed us to run multiple samples in parallel. While most systems could only run 4 or 8 slides, the HS Pro enables us to process up to 48 multi-segment slides per run."

"Automation was a major consideration when assessing microarray instruments. Although we were already performing a majority of these studies manually, automation reduces the 'noise' inherent in manually processed experiments,

helping to improve the quality of results and simplify data interpretation. Coupling the HS Pro with the walkaway operation provided by the PowerScanner also gives us the capacity we need as a core facility, without causing an excessive drain on resources," Dr Quintana concluded.

To find out more on Tecan's microarray solutions, visit [www.tecan.com/microarray](http://www.tecan.com/microarray)

To find out more on The Center for Neurologic Diseases, visit [brain.bwh.harvard.edu](http://brain.bwh.harvard.edu)



The PowerScanner offers walkaway scanning for higher throughput

The orange ribbon is a symbol of Multiple Sclerosis awareness

