

SpotLight On: ICTR Assay Services Laboratory

The Assay Services group at the Wisconsin National Primate Research Center (WNPRC) is one of the laboratories affiliated with UW ICTR in the collaborative model used by the ICTR Translational Technologies and Resources Core (TTRC). Assay Services provides modern, efficient, and cost-effective measurements in a centralized facility to WNPRC investigators, ICTR members, other Clinical and Translational Science Award site members, and other NPRCs, as well as to investigators at universities across the US and internationally.

Available services include method development and high throughput analyses of steroids, hormones, proteins, peptides, bioamines, biomarkers, and drug compounds to aid NIH-funded research with an emphasis on non-human and human primates.



Toni Ziegler, PhD, Assay Services Director, comments, "We specialize in custom development of new assays to meet the needs of investigators. Our focus is on effective, cost-sensitive approaches for accurate measurement of analytes critical for clinical and translational research."

Toni Ziegler
PhD

WNPRC signed a memorandum of understanding with ICTR creating Assay Services and committing to offering the best possible pricing to ICTR members. Available services range from consultation on methods, sample preparation and assay measurements, to data analysis and validation.

Multi-steroid analyses

Custom liquid chromatography/mass spectrometry (ABSciex QTRAP) methods developed at Assay Services can measure nine different adrenal and reproductive steroids in a single injection. This approach is readily adaptable to measure steroids in blood, urine, and cerebral spinal fluid, as well as live tissue secretions and hair.

A prerequisite for the approach was the ability to measure steroids with very high sensitivity. For instance, the level of quantitation for estrone and estradiol is 2.4, 1.2 pg/ml, respectively and this is well below physiological levels for both men and women. This sensitivity allows performance of special projects that require measurement of small amounts of sample containing low concentrations of analyte.

Vitamin D metabolites

Another important focus of QTRAP LC/MS/MS has been the development and quantitation of the Vitamin D metabolites including 25-hydroxyvitamin D_{2&3} and 1,25-dihydroxyvitamin D_{2&3}. Methods originating at Assay Services have allowed measurements of very low concentrations of Vitamin D in samples from both human and nonhuman primates; the limits of detection are 0.5 ng/ml and 15 pg/ml for 25-hydroxyvitamin D and 1,25-hydroxyvitamin D, respectively.

Ziegler comments, "Our lab participates in the National Institute of Standards and Technology (NIST) quality assurance program for Vitamin D measurement. The high quality of these assays

has contributed to both publications and extramural research support for several ICTR investigators."

Development of still newer assays for Vitamin D metabolites, in particular, a panel including 24,25- dihydroxyvitamin D_{2&3}, 25-hydroxyvitamin D, 1,25- hydroxyvitamin D, cholecalciferol (Vitamin D₃), and ergocalciferol (Vitamin D₂), will contribute to understanding individual variation in human metabolism of the Vitamin D hormone and identify the individual metabolic pathways for Vitamin D.

High through-put studies

Assay Services has modified many analyses for high through-put studies. The QTRAP LC/MS/MS has multiplexing capabilities so that twice as many samples can be run within a given time frame allowing mass spectrometry methods to be more practical. Radioimmunoassay methods for proteins, peptides and steroids allow hundreds of samples to be run in a single assay. Additionally, the service can analyze high volumes of samples, when required for a large study.

Voucher funding available

Assay Services is one of the laboratories participating in the ICTR Voucher Awards program offered through TTRC (ictr.wisc.edu/FundingOpportunities). Craig Atwood, PhD, associate professor of medicine and an ICTR voucher recipient comments, "The voucher award from ICTR allowed us to use Assay Services to generate preliminary data important for our ongoing applications for grant funding. In addition, the data acquired have helped us refine our experimental protocols for steroid measurements and complimented other data collected for our project."

More information can be found on the Assay Services home page (wprcfs.primat.wisc.edu/assay/assay.php), or by contacting Toni Ziegler, ziegler@primate.wisc.edu. For service, please submit an online consult form (ictr.wisc.edu/hormonelab).

Meet Amita Kapoor: Assay Services Methodology Researcher



Amita Kapoor
PhD

Amita Kapoor joined Assay Services in September 2011. She completed her bachelor's degree in Biology and Psychology at the University of Toronto in 2002. Amita earned her PhD in physiology at the University of Toronto in 2008, and completed postdoctoral fellowships at the University of Toronto and the Harlow Primate Laboratory at UW. Her research focus is on non-invasive measures to assess the relationship between hormone exposure during pregnancy and subsequent maternal hormone levels and behaviors during the postnatal period. In Assay Services, Amita specializes in developing novel methodology for QTRAP mass spectrometry including detection of multisteroids in human and nonhuman primate hair. She can be contacted at akapoor@primate.wisc.edu.