

Animal Nutritional Developmental Studies

MLM Medical Labs Expertise

Our experienced nutrition researchers are here to support scientists and other experts in animal health/nutrition who are seeking to improve quality of life of our animals at every stage of development. Standard and customizable analyses are performed in purpose-designed GLP-compliant laboratories by our scientists. Our strong collaboration with industry clients achieves our mutual goals for food product quality improvement and, ultimately, the well-being of companion and farm animals.

Services include:

- Cell Based Assay
- Protein Biomarker Assessments (single/multiplex)
- Genomic Analysis
- Histological Assessment
- Flow Cytometry Analysis (In Development)

Cell Based Assay

MLM has experience employing animal-based cell lines to evaluate emerging nutritional innovations via customizable biomarkers such as those described below. Particularly, animal gastrointestinal, immune or other cell lines can help provide insights into general metabolic or inflammatory response to foods or supplements. This in turn can help screen potential products or additives for greater efficiency. Additionally, we have the capabilities to establish custom cell-based assays for many different therapeutic areas (e.g. gut inflammation, respiratory disease, dermal inflammation) which can provide additional support for therapeutic claims.

Examples Cell Assays:

- Peripheral Blood Mononuclear Cells (PBMCs)
- Colonic Endothelial cells

Protein Biomarker Assessments

MLM offers animal sample testing of a broad range of matrices and customizable protein markers. We can utilize Luminex or MSD platforms for large metabolic or inflammatory biomarker screening, as well as individual ELISA or enzyme-based assessment. *Currently, we are developing assays for flow cytometry testing for differentiating immune cell populations within companion animal samples.*

Examples of Biomarker Assessments:

- Immune Panels for Canine, Feline, Porcine Metabolic Panel/Assays for Canine, Feline General Protein/Activity Assays
- General Activity Assays

In Development:

- *Canine/Feline General Immune Panels for Flow Cytometry*

Genomic Testing

Genomic markers may be evaluated using qPCR assessment allowing us to monitor changes in response to therapy or diet. MLM can further use mRNA expression to assess disease onset, analyze immune function, track therapeutic efficacy. Additionally, we can selectively monitor gut bacterial population in response to diet or inclusion of probiotics in food.

Examples Genomic Markers:

- Immune Marker Testing

Histological Assessment

Animal tissue pathology may be assessed histologically using standard stains such as hematoxylin and eosin (HE) to evaluate general inflammation/immune cell infiltration or Masson's Trichrome (MT) to look at collagen/fibrosis. We can also assess more specific targets via immunohistochemistry (IHC) or immunofluorescence (IF). We can additionally utilize *in vitro* hybridization (ISH) to look at genomic markers.

Example Stains:

- Hematoxylin and eosin (HE)
- Masson's Trichrome (MT)
- Periodic acid-Schiff (PAS)
- Picrosirius red (PSR)
- IHC
 - Mouse: CD3, CD4, CD8
 - Porcine: CD3, Occludin, ZO-1, TNF- α
 - General: HA tag

Contact our scientific team with any questions about our services. We look forward to providing value to your research and improving the quality of products available on the market.

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