Cerebrospinal fluid proteomic profiling for biomarker discovery in canine non-infectious meningoencephalitis

Lynsey Petersen, Dr. Luke Wittenburg and Dr. Christine Toedeusch
UC Davis School of Veterinary Medicine, Department of Surgical and Radiological Sciences, Davis, CA.

Introduction

- **Canine non-infectious meningoencephalitis:**
  - Affects 1 in 4 dogs with neurologic disease
  - Presumably immune-mediated
- Diagnosis is problematic
  - Post-mortem via histopathology
  - Ante-mortem via brain biopsy
  - Rarely performed in clinical practice
- Lack of antemortem diagnoses has mitigated improvements in patient care
- **Critical need for ante-mortem diagnostic and therapeutic biomarkers!**

Aims and Methodology

**Specific Aim:**
1) Determine the CSF peptide signature of dogs with non-infectious meningoencephalitis relative to normal dogs and dogs with non-inflammatory neurologic disease using unbiased tandem mass spectrometry.

Archived CSF samples histopathologically confirmed cases:
- Normal (n=6)
- Granulomatous meningoencephalitis (GME; n=6)
- Necrotizing meningoencephalitis (NME; n=6)
- Oligodendroglioma (Oligo; n=5)

21 Viable Biomarker Candidates

![Fig 1: 92 DEPs in GME and NME relative to normal.](image)

Top Biomarker Candidates:

**Acid Sphingomyelinase-like Phosphodiesterase & Chitinase-3-like protein**

![Fig 3: Expression patterns of top biomarker candidates for GME and NME.](image)

Conclusion

- CSF proteomic profiling using mass spectrometry:
  - Reference library for canine proteome
  - Viable biomarker discovery platform in canines
  - Identified 21 biomarker candidates
- **Rationale for validation of top biomarker candidates via ELISA:**
  - Acid sphingomyelinase-like phosphodiesterase
  - Chitinase-3-like protein

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