Optimizing Media Conditions to Enhance *Toxoplasma gondii* Cyst Growth

Margaret Moore  
Dr. Paul Davis Laboratory  
Molecular Parasitology
What is *Toxoplasma gondii*?

- Obligate intracellular protozoan
- More than 60 million people in the US are infected with Toxoplasmosis
Toxoplasmosis

- **Flu-like symptoms:**
  - Body aches
  - Swollen lymph nodes
  - Headache
  - Fever

- **Severe symptoms:**
  - Confusion
  - Seizures
  - Blurred vision
  - Brain lesions
Transmission

- Vertical transmission
- Blood transfusion
- Human contamination
  - Contact with cat feces
  - Contaminated water and vegetables
  - Raw or undercooked meat

- Tissue cysts
  - Cat contamination (hunting)
  - Fecal oocysts
  - Oocyst spread
Chronic Infection

- Parasites can develop into bradyzoite cysts within cells to avoid an immune response
- These cysts can persist in human tissue for years escaping both drug therapies and the immune system
Research

• To investigate cell culture medias of varying richness on optimizing bradyzoite cyst growth
• Determine whether slow growth in minimal nutrients contributed to larger, stronger cysts
Cell Media of Varying Richness

- D10
  - 10% Serum
  - Dulbecco's Modified Eagle Medium (DMEM)
    - M199
- D1
- DMEM1
- MEM1
  - Minimum Essential
Under a Fluorescence Microscope

D1: Day 6

DMEM1: Day 6

D10: Day 6

MEM1: Day 6
Future Directives

• To compare the number, not only size, of viable cysts between the more nutrient-rich mediums

• To extend the study with D10 media to observe how large the majority of cysts can grow without bursting
Acknowledgements

• Gabrielle Watson
• Dr. Paul H. Davis
• All members of Davis Lab
• The Fund for Undergraduate Scholarly Experiences (FUSE)
References

- http://www.learningradiology.com/archives05/COW%20168-Toxoplasmosis/toxocorrect.htm
- http://cmr.asm.org/content/26/1/58.full
The University of Nebraska does not discriminate based on race, color, ethnicity, national origin, sex, pregnancy, sexual orientation, gender identity, religion, disability, age, genetic information, veteran status, marital status, and/or political affiliation in its programs, activities, or employment.