Novel Monoclonal Antibodies against Neospora Caninum

Tech ID: 21464 / UC Case 2011-418-0

SUMMARY

UCLA researchers have developed a large number of highly specific monoclonal antibodies against the intracellular parasite *Neospora caninum* that can be used for diagnostic or research purposes.

BACKGROUND

Apicomplexan parasites cause a wide array of diseases of medical and veterinary importance including malaria (*Plasmodium spp.*), toxoplasmosis (*Toxoplasma gondii*), coccidiosis (*Eimeria spp.*) and neosporosis (*Neospora caninum*). While the biology of the human pathogens is better understood, little is known of how the veterinary pathogens infect their specific hosts and cause disease. *Neospora caninum* is an important veterinary pathogen that causes abortion in cattle and neuromuscular disease in dogs. *Neospora* has also generated substantial interest because it is an extremely close relative of the human pathogen *Toxoplasma gondii*. While for *Toxoplasma* there are a wide array of molecular tools and reagents available for experimental investigation, relatively few reagents exist for*Neospora*.

INNOVATION

The researchers have developed a large number of highly specific and robust monoclonal antibodies directed against *Neospora caninum*, which can be used for diagnostic or research purposes. They isolated a total of forty-six monoclonal antibodies against a variety of parasite organelles and identified the antigen for many of these by immunoaffinity purification and mass spectrometry. Included are antibodies that recognize the cellular components necessary for *Neospora* infection, such as those that allow for parasite invasion and hijacking of the host cell for intracellular survival. Most of the antibodies are specific to *Neospora caninum*, but some cross-react with *Toxoplasma gondii*. Together, this work will greatly enhance the post-genomic era of *Neospora* and enable functional comparisons between these important apicomplexan parasites to provide new clues to specific targets for therapeutic intervention.

APPLICATIONS

- Antemortem serological diagnosis of *Neospora* infection in dogs or cattle.
- Cross-reactivity of some of the antibodies permits diagnosis of *Neospora* or *Toxoplasma* infection using a single reagent.
- Provides new tools to study the cell biology of infection by apicomplexan parasites.

ADVANTAGES

- Provides many new monoclonal antibodies against *Neospora* to potentially provide more accurate diagnosis of infection.
- Allows for the detection of specific *Neospora* organelles, providing subcellular resolution for research purposes.

STATE OF DEVELOPMENT

The antibodies are at the "working prototype" stage; i.e., ready for development for diagnostic test kits or for use by research laboratories.

RELATED MATERIALS

- Sohn CS et al., Identification of novel proteins in Neospora caninum using an organelle purification and monoclonal antibody approach. PLoS ONE 6(4): e18383. doi:10.1371/journal.pone.0018383
- Dubey JP and Schares G, Diagnosis of bovine neosporosis. Vet Parasitol. 140(1-2):1-34 (2006)

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OTHER INFORMATION

KEYWORDS

Veterinary Diagnostics, Antibodies, Infectious disease, Parasites

CATEGORIZED AS

- **Agriculture & Animal Science**
  - Animal Science
- **Biotechnology**
  - Health
- **Medical**
  - Diagnostics
  - Disease: Infectious Diseases
  - Research Tools
- **Research Tools**
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- **Veterinary**
  - Diagnostics

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