**Medical Education and Research Grant Outcome Report**

**Name:** Creation of a Bovine *Cryptosporidium* Vaccine to Reduce Outbreaks in Human Populations  
**Principal Investigator:** Laura J. Knoll, PhD, Associate Professor  
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**Department:** Medical Microbiology & Immunology  
**Program:** New Investigator Program  
**Grant Duration:** 03-01-07 to 07-30-08 (16 months)  
**Expenditures:** $100,000 (100% expended)  
**Use of Funds (Taxonomy):** Basic research  
**Research Keywords:** Parasite, vaccine, antigens, *Cryptosporidium*, *Toxoplasma*

**Description:** Illness and mortality stemming from the *Cryptosporidium* parasite are problems in Wisconsin (where the country's largest outbreak occurred in Milwaukee in 1993) and nationwide. Limited treatment options for *Cryptosporidium* point to the need for a vaccine. Since cattle are a known source for *Cryptosporidium* outbreaks in humans, a bovine vaccine—with commercial applications in the dairy industry—would reduce bovine-to-human transmission. This development would have a tremendous health impact on the state's population.

The aim was to: (1) express *Cryptosporidium* surface antigens in non-disease-causing strains of a closely related parasite, *Toxoplasma gondii*, and (2) test whether the vaccine strain was protective in mice.

**Results:**  
**Aim 1:** The antigen Cpgp40/15 was expressed on the surface of the *T. gondii* strain.  
**Aim 2:** Preliminary results show that the strain was protective against lethal doses of *Cryptosporidium*.

These experiments will be repeated with larger numbers of mice, and with sub-lethal doses of *Cryptosporidium*. The intention is to quantify the protective immune response and ultimately the effectiveness of the vaccine.

**Met Objectives:** Project completed  
**Timeline for Application of Results:** 5-7 years

**New Partnerships or Collaborations:** Collaborations with researchers at Tufts University, and with the UW School of Veterinary Medicine.

**Matched Dollars (cash or in-kind):** $0

**Dissemination:** Work continues with Wisconsin Alumni Research Foundation on licensing issues related to vaccine development.

**Additional Funding:** Dr. Roberta O'Connor in Dr. Ward's lab (Tufts University) received a National Institutes of Health R21 grant, part of it involving further research on the *Toxoplasma/Cryptosporidium* vaccine. Dr. Knoll is a collaborator on this grant.