Toxoplasmic Retinochoroiditis in the Hamster

To the Editor:

The article by Pavesio and colleagues (*IOVS* 1995;36:2166–2175) concerning the clinico-pathological features of *Toxoplasma*-associated retinochoroiditis in a hamster model is of interest, particularly when the need to identify and test novel treatments for this ocular infection is considered. The value of their study was clearly stated, as the ease of production of ocular and protozoological manifestations in both eyes of the infected animal after a relatively short post-infection period, when overt clinical signs of systemic toxoplasmosis, had not become apparent. There are a number of issues, however, that merit clarification.

Many of the histopathologic features described are reminiscent of those recorded from a murine model of congenital ocular toxoplasmosis,[1,2] particularly selective outer retinal destruction and vasculitis. Such lesions are similar architecturally to those observed in experimental autoimmune uveoretinitis.[3] This observation has led us to postulate that *Toxoplasma*, in some circumstances, may act as a type of adjuvant in the induction of retinal inflammation.

The absence of *Toxoplasma* antigen without intact tissue cysts confirms our own light microscope immunohistochemical observations using the mouse model.[4] We have, however, detected such antigen in brain tissue from our model using more sensitive immunoelectron microscopy.[5]

The authors draw attention to differences in the intracellular status of tissue cysts between the ME 49 and Beverley (RRA) strains of *Toxoplasma*, suggesting that the former can exist extracellularly in murine brain tissue. Detailed ultrastructural and immunohistochemical studies have consistently shown that in the eye and brain of the mouse model, intact tissue cysts of the RRA strain always are located intracellularly. In the retina, they reside within neurones or Müller cells.[6]

It has been suggested that the murine model of ocular toxoplasmosis would enhance the expeditious evaluation of novel agents for efficacy in specific disease states.[7] The hamster model may be more useful in this context, with the proviso that if the intact tissue cysts are truly "extracellular" within the retina of these animals, the potential usefulness of candidate drugs would have to be examined further in situations in which there is definite evidence of an intracellular location. This is of special importance for the prevention of recrudescence of ocular toxoplasmosis, which may involve activation of the intact tissue cyst.

For these reasons, we contend that the quest for a satisfactory animal model of ocular toxoplasmosis must be continued. This is especially so in the investigation of factors associated with the immunopathology of the infection. In this context, it would have been useful if the authors had recorded the age and sex of their experimental animals, factors that are known to influence the outcome of a *Toxoplasma* infection in rodents.

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References

1. Lee WR, Hay J, Hutchinson WM, Dutton GN, Siim JC. A murine model of congenital toxoplasmic retinochoroiditis. *Acta Ophthalmol.* 1983;61:818–830.
2. Dutton GN, Hay J, Hair DM, Ralston J. Clinicopathological features of a congenital murine model of ocular toxoplasmosis. *Graefe's Archiv Clin Exp Ophthalmol.* 1986;224:356–364.
3. Chan CC, Caspi RR, Ni M, et al. Pathology of experimental autoimmune uveoretinitis in mice. *J Immunol.* 1990;3:247–256.
4. Hay J, Dutton GN, Ralston J. Congenital toxoplasmic retinochoroiditis in the mouse: The use of the peroxidase anti-peroxidase method to demonstrate *Toxoplasma* antigen. *Trans R Soc Trop Med Hyg.* 1985;79:106–109.
5. Sims TA, Hay J, Talbot IC. Ultrastructural immunocytochemistry of the intact tissue cyst of *Toxoplasma* in the brains of mice with congenital toxoplasmosis. *Ann Trop Med Parasitol.* 1990;84:141–147.
6. McMenamin PG, Dutton GN, Hay J, Cameron S. The ultrastructural pathology of congenital murine toxoplasmic retinochoroiditis: I: The localization and morphology of *Toxoplasma* cysts in the retina. *Exp Eye Res.* 1986;43:529–543.
7. McCabe RE, Oster S. Current recommendations and future prospects in the treatment of toxoplasmosis. *Drugs.* 1989;38:973–987.