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**The Human Antibody Response To  
*Giardia intestinalis***

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Judy Lai Peng Chan  
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## Abstract

Giardiasis is usually diagnosed in the laboratory by microscopic examination of faeces for the presence of cysts and / or trophozoites. However in principle, it is possible that *Giardia* infection could be diagnosed serologically. To investigate this possibility an Enzyme Immunoassay (EIA) was developed using *Giardia*-specific mouse serum as antibody.

The efficiency of different *Giardia* antigen preparations to detect antibody in this test was investigated. The antigens included live trophozoites, frozen and thawed trophozoites, sonicated trophozoites, trophozoite membranes and cysts. Antibody titres were low and no marked differences were detected when the four different antigens were compared. However, since following a natural infection the immune response to surface proteins probably predominates, we concluded that live trophozoites or cysts represented the most appropriate antigens to use in an EIA test to detect *Giardia*-specific antibody in human serum.

Live trophozoites adsorbed to polystyrene microtitre wells were removed by the washing procedure, thus giving an insensitive test and inconsistent results. This problem was overcome by precoating the microtitre wells with poly-l-lysine following which trophozoites and cysts adhered to the wells strongly enough to resist the washing procedures. The EIA test was optimised with *Giardia*-specific mouse serum as antibody and the same system was used to detect antibody in human serum.

IgG, IgM, and IgA antibody were assayed in "current infection", "convalescent" and "negative control" human sera. IgG antibody titres were slightly elevated in "convalescent" sera as compared to the other two groups. IgM antibody titres were slightly elevated in "current infection" sera and IgA antibody levels were not found to be elevated.

Since IgM antibody is present early in an infection but does not persist, its presence or absence could, in principle, be used to distinguish a current from a previous infection of *Giardia*. However, only slightly elevated levels of *Giardia*-specific IgM antibody in "current infection" sera were detected in our tests so this approach to diagnosis will need further development if it is to be used for diagnostic purposes.

*Giardia* is not an invasive organism and it is possible that some antigens may play a major role in eliciting an immune response in humans. Thus, potential *Giardia* antigens were investigated by "immunoblotting" total *Giardia* proteins with human sera from clinically diagnosed cases of giardiasis.

It was found that the human antibody response to *Giardia* varies between individuals and many *Giardia* proteins reacted with the immune human sera. However, IgG antibody found in many of the serum samples reacted with a 200 kDa, 62 kDa and 42 kDa protein. IgA and IgM antibodies also reacted with a 62 kDa protein which may be similar to a 55 kDa structural protein (tubulin) found in *Giardia*.

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