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Lymphoproliferative responses of splenocytes before and after challenge with Schistosoma haematobium in C57BL/6 mice vaccinated with human anti-Idiotypes

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Anti-idiotypic vaccines (anti-Id or antibody 2; Ab2) in experimental schistosomiasis engender varying degrees of resistance to challenge infection. To further characterize the mechanisms involved in the induction of protective immunity associated with such a vaccine model, spleen cells of mice vaccinated with human Ab2 (HAb2) were investigated for their lymphoproliferative responses before and after challenge infection with normal S. haematobium cercariae. HAb2 was purified from sera of chronically infected patients using protective rabbit antibodies (RAb1) isolated from sera of rabbits multiply immunized with UV-irradiated cercariae by affinity chromatography over soluble worm antigenic preparation (SWAP). Vaccination of C57BL/6 (C57) mice with HAb2 resulted in approximately 31% and approximately 36% protection in two experiments of resistance to infection. Splenocytes were collected prior to challenge at week 6-post initial immunization and after challenge at days 6, 10, 28 and 90. Prior to challenge, in vitro splenic responses of HAb2-vaccinated animals (HAb2-group) to phytohaemagglutinin (PHA) declined while both SWAP and HAb2-driven responses increased, all compared to naive control. After challenge, PHA responses increased in the two test groups on day 6 then significantly decreased to lower levels. On the other hand, SWAP- and HAb2-driven responses of HAb2 group increased by day 6 then declined while the same responses in infected control mice increased on days 10 through 28 and decreased by day 90. Generally, proliferation obtained following in vitro stimulation with HAb2 was greater than that with SWAP in the HAb2-group after challenge. These results suggested that human anti-Id antibodies could mimic at the T cell level the properties of a protective antigenic epitopes of the irradiated-cercariae vaccine.