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Effect of Lithium in Immunodeficiency: Improved Hematopoiesis and Increased Survival Following LP-BM5 Murine Leukemia Virus (MuLV) Infection. V.S. Gallicchio[1], N.K. Hughes[1], K.F. Tse[1], J.K. Morrow[1], O. Oakley[2], C. Mayhew[2] and N.J. Birch[2] [1]Markey Cancer Center, University of Kentucky, Lexington, KY, USA, [2]Biomedical Research Laboratory, University of Wolverhampton, Wolverhampton, United Kingdom.

Lithium salts induce the production of hematopoietic cells following administration *in vivo* and minimize the reduction of these cells following treatment with either radiation, chemotherapeutic or anti-viral drugs. We have previously demonstrated that lithium, when administered *in vivo* to immunodeficient mice infected with LP-BM5 MuLV (MAIDS), reduced the development of lymphadenopathy, splenomegaly, and the lymphoma associated with late-stage immunodeficiency disease in this model and increased survival compared to virus-infected controls not receiving lithium. We report the results of *in vivo* studies in MAIDS that determined the effects of lithium on hematopoietic progenitors from bone marrow and spleen from immunodeficient mice receiving lithium carbonate (1mM) placed in their drinking water compared to virus-infected controls not receiving lithium. Time-points evaluated were at weeks 1, 5, 9, 13, 17, and 21 post-viral infection. Virus-control-mice not receiving lithium demonstrated all the signs that are characteristic of MAIDS, i.e., splenomegaly, lymphadenopathy, hypergammaglobulinemia, reduced hematopoiesis and death. Infected mice receiving lithium did not show these changes. Analysis of viral genome expression of p12 *gag* envelope viral protein by RT-PCR from infected tissues was detected from lithium treated viral-infected mice; however, the level of expression was less than observed from virus-infected animals not receiving lithium. These studies further demonstrate that lithium influences the disease process in MAIDS and restricts the development of hematopoietic suppression that develops in this retroviral model of immunodeficiency.

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Antiviral Activities Induced by Becombinant BCG Vector-based Vaccine for HIV-1 in Cynomolgus Monkeys

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Strategies for the prevention of HIV/AIDS will require both humoral and cellular immunities that contribute to protection from HIV infection or progression to disease states. A recombinant *Mycobacterium bovis* BCG (BCG) that secretes a chimeric protein consisting of V3 principal neutralizing epitope of Japanese consensus HIV in α-antigen protein was inoculated to four cynomolgus monkeys subcutaneously. Neutralizing antibody activities against HIV-MN or SHIV-MN were achieved in each of the 4 inoculated monkeys at three weeks of single inoculation and persisted for more than 8 months tested. The immune serum IgG showed neutralization activity against field isolates that match the neutralization sequence motif. High levels of CTL activity were achieved after 10 weeks of rBCG inoculation. Control monkeys showed no significant levels of activities of HIV neutralization and CTL.

Two of the 4 monkeys received a challenge injection of 15 TCID50 of SHIV-MN. Over the next 10 weeks of post challenge, immunized monkeys exhibited better virus clearance than the controls and one of the two blocked the SHIV completely. We evaluate the levels of protection that achieved by the inoculation of rBCG.