



In Vitro Antibody Production Enables HIV Infection Detection In Window Period -- Key To Safer Blood

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Researchers in Israel and Kenya have shown that the contribution of variable degrees of immune suppression, either due to existing chronic infections such as parasitemias and/or nutrition, in different populations may influence and prolong the serological-diagnostic window period of HIV. However, the immunosuppression can be overcome, by in-vitro enhancement of antibody production (termed-Stimmunology). The results, which appear in the August 2009 issue of *Experimental Biology and Medicine*, show that pre-treating the whole blood sample in the SMARTube™ containing immune potentiating agents promoted the synthesis and release of antibodies against HIV-1 prior to their detection in corresponding plasma samples in a group of donors who would otherwise be classified as HIV-1 seronegative blood donors. The identification of techniques that can lead to detection of HIV infection during this window period is of obvious public health importance especially in resource poor settings highlighting the importance of these findings. Overcoming the suppression, in-vitro, led to the production of detectable levels of anti-HIV antibodies in the whole blood sample and to the detection of potentially infectious blood units which were missed by regular HIV serology. Interestingly, the ratio of missed infections among the total HIV infected blood donors was higher among the younger (high-school) donors versus adult donors. The research team, Dr. Jasper Mumo, immunologist from the Department of Human Pathology, University of Nairobi, Kenya, Dr.

Ami Vansover, head of the Virology Laboratory, Public Health Laboratories, Ministry of Health, Israel, and Dr. Tamar Jehuda-Cohen, an immunologist, Faculty of Biomedical Engineering, Technion-Israel Institute of Technology, ran the same HIV antibody tests using both regular plasma and SMART-plasma (plasma after the Stimmunology step) from blood donors in Kenyata hospital. Dr. Jehuda-Cohen noted that "this study, offers one of the keys to making the blood supply safer, by overcoming the problem of this protracted window period perhaps unique to certain field study sites with a high incidence/prevalence of HIV-1. This is true not only for HIV but also for other infections such as HCV, which has even a longer window period than HIV"

In summary, in-vitro enhancement of antibody production, made simple by the SMARTube™, has been shown to enable the earlier detection of HIV infection. This is critical for saving lives not only via a safer blood supply but also by detection of HIV infection among pregnant women who seem to have a very long window period. "A pregnant women testing false negative for HIV will not be offered ART which could have saved her baby" said Dr. Jehuda-Cohen.

Dr. Steven R. Goodman, Editor-in-Chief of *Experimental Biology and Medicine* said "The article by Mumo and colleagues may lead to a change in testing paradigms and algorithms in HIV and other infections with a diagnostic window period."