

## **ISS in South Africa, the Tat vaccine improves the effect of anti-HIV drugs**

Published on Retrovirology. The ISS study conducted in South Africa confirms the effectiveness of the Tat vaccine developed by the National AIDS Center. The research is part of an extensive Italy-South Africa Cooperation Program for the fight against HIV-AIDS. The phase II clinical study conducted in South Africa has confirmed that the therapeutic Tat vaccine against HIV/AIDS can improve the therapies available today for the treatment of HIV infection. The results will be published in the peer-review open access Retrovirology journal. "By administering a very small amount of the Tat protein - Barbara Ensoli explained - we were able to induce an immune response capable of improving the effectiveness of anti-HIV drugs, highlighted by a significant increase in CD4+ T cells. A result that confirms what already seen in a previous trial conducted in Italy". The research involved 200 patients - in South Africa there are seven million infected people, equal to 20% of the entire population - in therapy with anti-HIV drugs, which act by blocking the replication of the virus. The participants in the study were "randomized" (i.e. randomly distributed) in two groups, who received three intradermal injections of 30 micrograms of vaccine or placebo, one month apart. The study was conducted in "double-blind", i.e. without the volunteers or experimenters knew who received the vaccine or placebo. The opening of the codes, which occurred at the conclusion of the study (48 weeks after the first vaccination), showed a significant increase in CD4+ T cells in the group of vaccinees compared to placebo. The increase of CD4+ T cells was particularly evident in patients with the lowest levels of CD4+ T cells at the time of vaccination.

### **How the Tat vaccine works**

The vaccine targets the HIV Tat protein, which is produced in the early stages of infection. Tat plays a key role in viral replication and disease progression, as it weakens the immune system. The vaccine acts by inducing protective antibodies capable of neutralizing the Tat protein produced by the various "subtypes" of the virus, including subtypes A, B and C circulating in Asia, Europe, America, and Africa. It promises, therefore, to increase the effectiveness of current therapies against the main forms of the virus present in the world, and ultimately to increase the life expectancy of people living with HIV.

This study confirms the results of a previous Phase II trial conducted in Italy in patients infected with different subtypes of HIV compared to African patients treated with anti-HIV drugs, published in Retrovirology, in which it was shown, in addition to safety, the production of antibodies against Tat and a significant recovery of CD4+ T cells. In the follow-up of the Italian study, three years after vaccination, a significant decrease in the blood 'reservoir' of "latent" virus, a silent form of the virus resistant to drugs, was also observed. The latent virus is responsible for the increase of plasma viremia

observed after the interruption of therapy or when the therapy is taken discontinuously, as it occurs in about 30% of patients under treatment. The reduction of the latent virus reservoir following vaccination is now the subject of a follow-up study also in South Africa, to confirm the data obtained with the Italian study.

### **The Cooperation Program**

The clinical trial is part of the "Programme in support to the South African Ministry of Health for the implementation of the National Programme of Global HIV-AIDS Response in the border areas between South Africa and surrounding countries and in selected regions" (see attachment), funded by the Italian Ministry of Foreign Affairs (MAE) with 20 million euros, directed by Dr. B. Ensoli (scientific responsible) and Dr. Paolo Monini (project leader in South Africa) in close collaboration with the Ministry of Health and the Medical Research Council of South Africa.

The results of the Programme have been evaluated by the United Nations Industrial Development Organization (UNIDO) which has monitored, over a period of about one year, the implementation procedures, the cost benefit ratio and the impact of the Programme in South Africa, hoping, in conclusion, that the testing of the vaccine will continue with a Phase III trial for registration in South Africa.

The Italian and South African counterparts are working to this end to solicit financial support from international organizations.