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European research in action

HIV/AIDS



Europe leading
the global fight

HIV/AIDS in perspective

Acquired ImmunoDeficiency Syndrome (AIDS) is the advanced form of infection with Human Immunodeficiency Virus (HIV), a condition that results in the progressive destruction of the body's immune system and, eventually, death. Transmission of the virus can occur through sexual contact, blood transfusion, sharing of syringes and from mother to child during pregnancy, birth and breastfeeding.

HIV/AIDS has become one of the worst pandemics in history. Since the first AIDS cases were identified in 1981, 60 million people have been infected and over 20 million have died. Women of childbearing age are the most vulnerable to sexually transmitted HIV infection and comprise the majority of the 5 million new infections each year. The virus affects the immune system, leaving victims defenceless and open to nerve degeneration, some types of cancer, and opportunistic infections, such as tuberculosis and pneumonia.

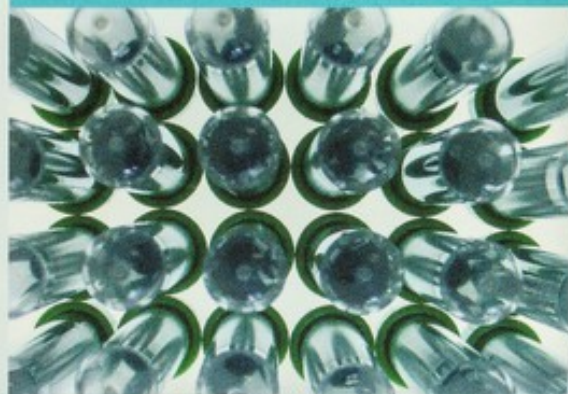
The European response

Since the beginning of the epidemic, the European Union has supported HIV/AIDS research and health-related interventions. Under the Sixth Framework Programme for Research and Development (2002-2006), research on HIV/AIDS is a top priority for the European Union.

At present, the Commission is funding HIV/AIDS research on new drug treatments, microbicides, and vaccines through new collaborative efforts within Europe and with developing countries. About €50 million are allocated each year to finance more than 300 academic and industrial research groups in Europe, including Eastern Countries, and Sub-Saharan Africa.

Living with HIV/AIDS

HIV/AIDS remains one of the most feared of all infections. People with HIV may show no symptoms for up to ten years, but they can still transmit the virus to others. They are often discriminated against, on the one hand based on irrational fears of infection and, on the other, because the infection is wrongly seen as a consequence of promiscuity, homosexuality or drug addiction. As the disease cannot be cured, health experts around the world urge people to use condoms, the most effective way to prevent HIV infection and transmission.





Towards an HIV/AIDS vaccine

An effective vaccine would be the ideal weapon in the fight against HIV infection. Unfortunately, global efforts in this direction have so far been unsuccessful. In order to provide new impetus, the European Union is funding new innovative approaches to develop an HIV/AIDS vaccine.

AVIP – AIDS Vaccine Integrated Project

AVIP is a joint European and African project aimed at developing a combined vaccine including both structural and regulatory HIV genes. Such a vaccine would provide both preventive and therapeutic effects, inducing immune responses against early and late HIV infection.

To ensure a positive outcome, priority has been given to vaccine combinations containing single antigens that are already approved for human use and with proven efficacy in preclinical models. The resulting compounds are to be tested in Europe and, ultimately, in those developing countries hardest hit by HIV/AIDS. The project also supports training, technology transfer and community involvement between the EU and these countries. The first vaccine trials using human volunteers will start in 2006.

www.avip-eu.org

MUVAPRED – Mucosal Vaccines for Poverty-Related Diseases

The HIV virus most typically enters the human body through the mucosal surfaces during sexual intercourse, infecting the local immune system. Hence, the induction of a mucosal immune response would be an important first line of defence in preventing the spread of the infection.

The **MUVAPRED** project aims to develop mucosal vaccines against HIV/AIDS and tuberculosis, another important disease transmitted through mucosal surfaces. Such vaccines can be administered via convenient mucosal routes, presenting many advantages when compared with injected vaccines.

The project is expected to provide candidate vaccines with proven safety and efficacy in humans, combining promising antigens and novel delivery systems. The first trials in humans will start at the end of 2005.

www.mucosalimmunity.org/muvapred





New measures to prevent HIV/AIDS transmission

While the development of an HIV/AIDS vaccine remains a hopeful avenue of research, there is a real and pressing need to expand the range of preventive measures against the disease. Microbicides, substances that can prevent sexual transmission of HIV, represent one of the most promising areas of research currently being pursued by the European Commission.

Research in this field is aimed at developing anti-HIV microbicides that are equally effective in preventing heterosexual and homosexual transmission of the virus. Self-administered topically applied microbicides would, in particular, empower women – who may have difficulties in negotiating the use of condoms with their sexual partners – to exert more control over their own HIV/AIDS destinies.

EMPRO – European Microbicides Project

This EU-funded project is developing new topical microbicides that block the entry of HIV at mucosal sites. The aim is to establish a pipeline of candidate microbicides from basic research through early human testing.

Newly developed molecules will be screened for inhibition of specific viral proteins or viral receptors. Efficacy will be rigorously tested *in vitro*, and the most promising compounds will then be further developed. Particular emphasis will be placed on compounds demonstrating synergistic activity with products more advanced in the development process. The **EMPRO** project should also provide a rational basis for the design of future microbicides.

www.empro.org.uk



The search for new HIV/AIDS drug treatments

While HIV/AIDS treatment has dramatically improved during the last ten years, current therapeutic options are still limited. Current treatments do not eradicate the virus. They are expensive, complicated and not available everywhere. Many treatments have side effects and induce viral resistance.

Consequently, there is a continuing need for new and better anti-HIV drugs. These can take the form of novel chemical compounds that attack known or new viral targets in the HIV replication cycle, or that interfere with cellular co-factors required for HIV replication.

TRIoH –Targeting Replication and Integration of HIV

The EU-funded **TRIoH** project brings together European researchers working on novel molecules that target viral replication and/or integration. The consortium gathers academic and industrial partners, including small and medium-sized enterprises, all linked by a central scientific strategy, aimed at blocking the molecular pathway from HIV viral entry and early replication to HIV integration.

The **TRIoH** project is following a multidisciplinary approach, combining basic science, biotechnology and innovative chemistry. It represents a major new lead in the study of HIV replication and integration, with the ultimate aim of developing new and better HIV/AIDS treatments.

www.kuleuven.ac.be/molvirgen/projects/trioh/indextr.htm

Cohort studies: improving existing treatments

Scientists from more than 100 of the best clinical research groups in Europe have joined forces to evaluate the best treatment options for HIV-infected children, pregnant women, and other adults, and to prevent mother-to-child transmission of the virus.

Through a number of projects, researchers are testing combinations of new and existing drugs in order to optimise HIV/AIDS therapy. They are also investigating how to overcome the ever-growing threat posed by the emergence of resistance to anti-HIV drugs.





Future perspectives

Under the Seventh Framework Programme, set to begin in 2007, the European Union will extend its research activities on HIV/AIDS. Finding new preventive technologies, vaccines and microbicides will continue to be a key aspect of the overall EC research strategy.

The Commission will further strengthen its strategic partnerships with global initiatives on HIV/AIDS, including the Alliance for Microbicide Development, a global coalition for the promotion of microbicides to protect both men and women from HIV infection. The European Commission is also a key partner in the Global HIV/AIDS Vaccine Enterprise, promoting HIV vaccine research and encouraging European researchers to collaborate with their international colleagues in the development of an effective HIV/AIDS vaccine.

In addition, the Commission will continue supporting people living with HIV/AIDS, financing research on new and better drugs, drug combinations and treatments.

The European and Developing Countries Clinical Trials Partnership (EDCTP)

The EDCTP is a major long-term initiative to accelerate the development of new clinical interventions to fight HIV/AIDS, malaria and tuberculosis in developing countries, particularly Sub-Saharan Africa. Work includes:

- Stepping up clinical trials of new and improved products, in particular drugs, vaccines and microbicides;
- Addressing the specific needs and priorities of developing countries with respect to research on HIV/AIDS;
- Networking European efforts for promoting HIV/AIDS research in Africa;
- Strengthening HIV/AIDS clinical trial capacities;
- Encouraging investment and participation by the private sector;
- Mobilising additional funds to fight HIV and AIDS.

Supported by €200 million in European Union funding within the Sixth Framework Programme, the EDCTP will continue to link European and African researchers, providing research capacity in developing countries.

www.edctp.org



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