The Cure Hunter

Françoise Barré-Sinoussi is renowned for discovering HIV. Now she's hot on the trail to find a cure for AIDS.

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Françoise Barré-Sinoussi is a French virologist who was awarded the 2008 Nobel Prize in Physiology or Medicine (along with her former mentor Luc Montagnier) for her role in the discovery of HIV in 1983. She is also the president-elect of the International AIDS Society, the group responsible for organizing the XIX International AIDS Conference (AIDS 2012) this summer in Washington, DC. Here, Barré-Sinoussi shares her thoughts on the possibility of a cure for AIDS and what it will take to make it a reality.

Until recently, people were very reluctant to discuss the possibility of a cure for AIDS. But given the quantum leaps we've made in AIDS cure research in the last 12–18 months, would you agree that people are more open to the idea of it now?
There has been an obvious change in considering the possibility of curing AIDS in the past years. The "Berlin patient," the HIV controllers, the growing data on the so-called post-treatment controllers (patients who are able to control their infection [without HIV meds] after receiving very early treatment)—all these natural or induced controls are bringing "proof of concepts" that let us think a cure, at least a functional one [one that enables the immune system to control HIV without the need for antiretroviral therapy], might be achievable.

Furthermore, there is now compelling scientific evidence that treatment is prevention. Given the current economic situation, the development of a short-course therapeutic strategy could be one answer to the challenge of the long-term sustainability of access to treatment.

Do you feel the mainstream media coverage of AIDS science and cure research accurately reflects the progress that's been made?
I would say the media coverage is partially accurate. I believe the information is quite good concerning the individual benefits of antiretroviral treatments, although the knowledge of an increased benefit to treat early versus late is not yet fully understood. People generally know that HIV can be a chronic condition [if one is taking antiretroviral medication (ARVs)], but they are less informed about the incomplete immune reconstitution and why HIV persists even when one is on ARVs. As a result, the requirement for mandatory life-span therapy is not always completely understood. They are often not enough aware of comorbidities and long-term side effects of both

the infection and the treatment.

The collective benefit of novel therapeutic strategies, in terms of preventing new HIV infections and its potential impact of ARVs on reducing the global HIV epidemic, still needs to be better explained in the media. This is especially true for donors and leaders who need to understand that increased investments in both the universal access to current ARVs and cure and vaccine research will prove extremely cost-effective.

Do you think it is possible to cure AIDS? If so, is it reasonable to hope it could happen in our lifetimes?
We now have evidence that it should be possible to achieve a state of drug-free permanent remission in people living with HIV. We have examples of HIV controllers who spontaneously control their infection. These individuals give us hope that we should be able to develop a treatment that would induce a similar control in all patients. Concerning the time line, I don't have a crystal ball to see the future, but the more we invest efforts and resources in the search for a cure, the faster we will get it.

How do you define "cure" for AIDS?
There are two distinct definitions depending on which clinical objective you want to achieve. The complete eradication of the virus from every compartment of the body is what we call a sterilizing cure. But there's also the possibility of a functional cure. Patients would remain infected but able to permanently and efficiently control their infection at undetectable level after treatment interruption without transmitting the virus to others.

What are the different types of cure research currently being studied?
Several strategies are being explored according to our basic knowledge of HIV replication and persistence. They aim at (1) purging the reservoirs by reactivating the virus in latently infected cells by agents like HDAC inhibitors, (2) targeting the residual replication on ARVs, (3) blocking the proliferation of latently infected cells and eliminating infected cells by immune intervention strategies, (4) targeting abnormal immune activation and inflammation on ARVs.

We certainly don't know which of these strategies will prove successful, but the scientific community is prone to think that a combined approach will probably be necessary to achieve a cure.

One of the barriers to linking people to and retaining them in care is HIV-related stigma and the reticence to see a doctor and take pills. Do you think this would change were a cure to be found?
A cure for HIV would be a fantastic tool to progressively address the problem of linking and retaining people living with HIV to care. I also think that it will have a great impact in reducing stigma and discrimination toward people living with HIV because people will not transmit the virus anymore. Of course, even if we have a cure, everything will not change overnight. A lot of advocacy would be needed to provide rapid universal access to a cure—as well as information to promote it.

In the fight for a cure, how important is it for the community to demand that we secure the necessary political and financial capital?
The community demand [for a cure] is the most essential component of the fight against HIV/AIDS. We need a strong community engagement to continue advocating for universal access but also to make political leaders and decision makers aware of the necessity to develop a cure for HIV/AIDS. The community demand is also the very core of researchers' work, so we also need them to work side by side with us to define which cure strategies will correspond to their expectations.

Would you be willing to speculate how much money is needed to significantly accelerate cure research?
This is one of the questions we are trying to answer with the "Towards an HIV Cure" initiative that the International AIDS Society is currently guiding. The first step of this initiative was to develop a scientific strategy defining the research priorities for a cure. This strategy will be released in advance of AIDS 2012. One of the next steps will be to evaluate the cost of the implementation of this strategy. I am personally convinced that we can save a fairly good amount of money if the scientific community works together and shares expertise. This is one of the main objectives of the "Towards an HIV Cure" initiative.

We have clearly seen the cure for AIDS emerging as a top priority in the research agenda of many funding institutions over the past few years. I am very confident that the yearly amount spent in HIV cure research will continue to grow providing we continue to advocate for it.

What must be done in the research fields in order for us to find a cure?
We need to work with open minds. The HIV cure may come from young non-HIV researchers bringing novel innovative ideas. I am convinced that we have a lot to learn from other areas of biomedical research. We also need to increase collaboration between the academic and private sectors.

What three things are most needed if we are to find a cure?
Innovation, multidisciplinary collaborations and funding.
