

Knowledge

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Treatment as Prevention: Reducing Cases of HIV/AIDS



(From left) Professor Zhiwei Chen discussing with Post-doctoral Fellows, Dr Ada LY Yim and Dr Zhiwu Tan, in the lab

One of the biggest challenges to the global medical profession in the last four decades has been finding a vaccine or cure for HIV/AIDS. The disease was first identified in 1981 and the goal has yet to be achieved, but in the meantime advances in halting the disease have been made by focusing on treatment as prevention: reducing the number of cases of HIV/AIDS by focusing on stopping partners of HIV/AIDS carriers from becoming infected. Since the establishment of AIDS Institute in 2007, Professor Zhiwei Chen of the Department of Microbiology and his team have led HIV and AIDS research in Hong Kong.

For years, the focus was on patient care, but by 2009 views had changed. “The scientific community realised if you treat the patients very effectively, then the chance for them to give the virus to the partners will be very minimal,” said Professor Chen. He and his team embarked on a campaign to share everything they had learnt with the government, clinicians, NGOs and the wider community to promote the benefits of treatment as prevention and to build awareness and educate the public about the

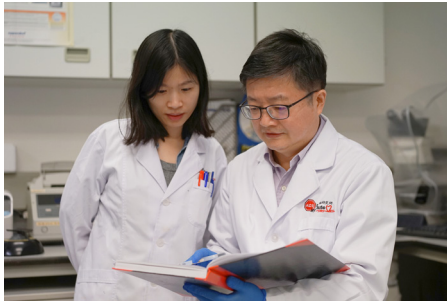
Fighting HIV/AIDS and COVID-19 using HKU Patented Technology

importance of AIDS prevention and control. The team published their work in scientific reviews, gave media interviews, attended local and international meetings, lectures and symposiums, organised community events and worked with NGOs to provide knowledge and training both locally and regionally. The team also organised community fund-raising activities to help more than 500 AIDS orphans in China.

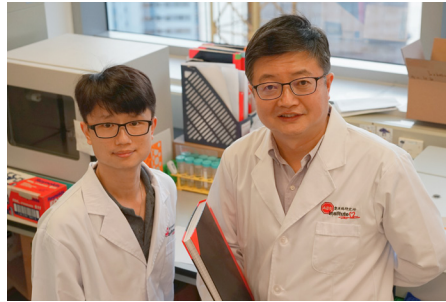
The persuasion effort took some time, but finally in 2017 the new approach became policy and has been implemented since then.

The results have been notable. “Based on the data, the annual number of infections indeed declined in recent years,” said Professor Chen. “I believe this strategy is one of the contributing factors. When you reduce the source of the virus, definitely you will see some reduction. For HIV, it’s using treatment as a biomedical intervention to minimise the secondary transmission.”

At the same time, the team has been working on the most critical scientific question in their field: the search for a vaccine or a cure for HIV/AIDS. In 2013, they made a breakthrough in vaccine technology. “We found that if we have a special way of delivering the antigen to the antigen-presenting cells, namely PD1-based vaccine, we were able to induce very potent antiviral immunity,” explained Professor Chen. “What we found is if the host immune response is strengthened, actually you can control the virus to an undetectable level in monkey models.”



Professor Zhiwei Chen (right) discussing with PhD Candidate, Ms Dongyan Zhou, on COVID-19 antibody drug discovery



Professor Zhiwei Chen (right) and his Post-doctoral Fellow, Dr Michael YC Wong



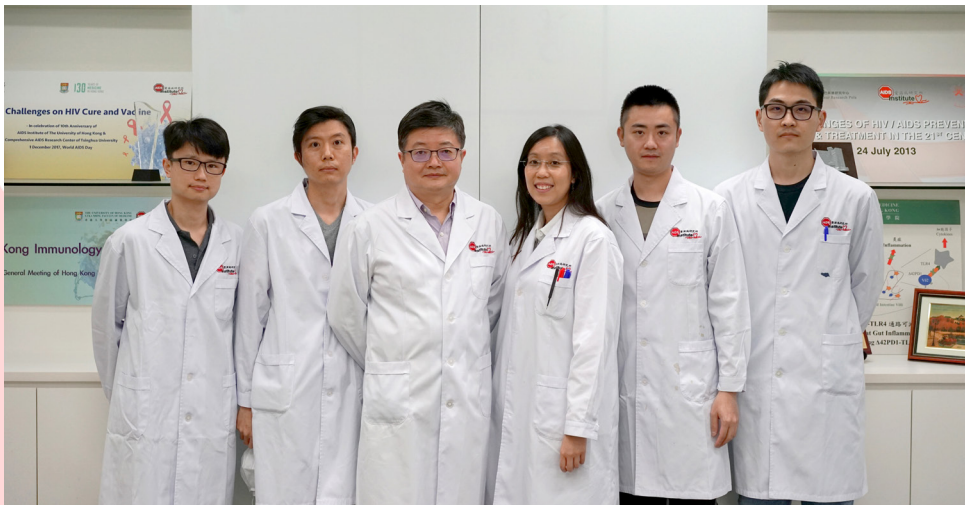
Professor Zhiwei Chen (left) advocating Treatment as Prevention in a Hong Kong Community Forum

To directly benefit the patients, Professor Chen's team has been working with a Hong Kong start-up through the University-Industry Collaboration Programme and is leading a Theme-based Research Scheme to develop a new biomedical product based on their discoveries which should enter clinical trials soon.

During their work, Professor Chen has learnt a lot about the steps and synergies needed to get a vaccine made. With the novel coronavirus sweeping the world, the team's work has taken on even greater urgency and the new patented PD1-based vaccine and the knowledge gained is being put to work in the search for an effective vaccine for COVID-19.

"Hopefully I think the impact of the platform of technology will be much bigger than we originally thought," said Professor Chen. "Now not only we have something already manufactured and ready in the near future for the human trial for AIDS, but we can also apply the technology for this new coronavirus."

Professor Zhiwei Chen of the Department of Microbiology received the University's Knowledge Exchange Excellence Award 2019 for the project 'Knowledge Exchange on HIV/AIDS to Promote HIV Prevention and Care'. 



(From left) Professor Zhiwei Chen's research team: Dr Michael YC Wong, Dr Zhiwu Tan, Professor Zhiwei Chen, Dr Ada LY Yim, Dr Runhong Zhou and Dr Tianyu Cao