

## Kudos to The Virus Hunters

Mathew BC, Daniel RS, Bordom J

Department of Medical Biochemistry and Department of Social and Preventive Medicine  
Faculty of Medicine, El Gabal El Gharby University, Gharyan, Libya

Key words: *AIDS, Epidemic, HIV, Human papilloma virus, Libya*

**To The Editor:** On 6th October the Nobel Assembly at Karolinska Institute, Stockholm, Sweden announced The Nobel Prize in Physiology or Medicine for 2008, and virologists all over the world had a lot to cheer about. Three "virus hunters" who worked with two different viruses brought honour to virology. Harald zur Hausen for his discovery of "human papilloma viruses (HPV) causing cervical cancer" and Françoise Barré-Sinoussi and Luc Montagnier for their discovery of "human immunodeficiency virus (HIV)" have been chosen for this year's award [1]. All three will deliver the Nobel Lectures on Sunday 7th December. The entire scientific community is waiting to hear about their encounters, relentless battles, and exploits against these pathogens. Their discoveries have paved the way for an astonishing progress in preventing HPV induced cervical cancer, and more zeal to find a successful vaccine against the HIV. Nobel prizes can be split between a maximum of three individuals and it indeed is a great irony that a stalwart like Robert Gallo, the "co-discoverer" of HIV had to be left out on technical or other reasons best known to the Nobel Committee. The Franco-American virus war between Luc Montaigner and Robert Gallo which started in 1984 and ended in 1987 is now part of scientific folklore. It is now known that the "French" lymphadenopathy associated virus (LAV) and "American" human T-cell leukemia /lymphoma virus type III B ( HTLV-IIIB ) were indeed one and the same, which is now known as HIV. Many among the scientific community, and foe turned friend Luc Montaigner himself, acknowledged that Robert Gallo deserved to be the third recipient, had the Nobel Committee honoured only those who contributed to the discovery of HIV [2].

About half a century ago when there was considerable scepticism whether viruses cause cancer, Harald zur Hausen postulated a role for oncogenic human papilloma virus ( HPV ) in cervical carcinoma. In 1983 he first identified HPA-DNA in cervix cancer biopsies, and thus the new, tumorigenic HPV16. In 1984 he cloned HPV16 and 18 and thus made these viruses available to the scientific community. His pioneering work demonstrated novel properties of HPV that lead to an understanding of mechanisms for papilloma virus- induced carcinogenesis and predisposing factors for viral persistence and cellular transformation [3]. HPV infection causes >550,000 cases of cervical and anogenital cancer worldwide annually, and is responsible for 99.7% of cervical cancer cases and an estimated 5% of all cancers worldwide [4,5]. Of the more than 100 HPV types known, HPV 16 and HPV 18 are responsible for approximately 70% of all invasive cervical cancers worldwide, and HPV types 6 and 11 cause approximately 90% of cases of genital warts [4, 6].

The development of the human papilloma virus vaccine is a major milestone in the development of cancer vaccines. Following the success of several clinical trials, pharmaceutical giant Merck in 2006 submitted a successful Biologics License Application for its prophylactic HPV virus like particle (VLP) vaccine Gardasil TM to the US Food and Drug Administration. Subsequently, Gardasil TM received a European license, and many other countries also permitted its licensing. This vaccine for girls and women aged 9-26 years, protect against HPV types 6/11/16/18. The second prophylactic HPV vaccine Cervarix TM, manufactured by GlaxoSmithKline against HPV types 16 and 18 has been licensed this year [6]. A recent systematic review of randomized controlled trials of prophylactic HPV vaccination have indicated that among women aged 15-25 years not previously infected with vaccine type HPV strains, prophylactic HPV vaccination was 96%-100% effective in preventing HPV 6/11/16/18-related cervical and anogenital precancers and genital warts [7].

Despite the remarkable promise of the current prophylactic HPV vaccines, their introduction into developing countries will present unique and considerable challenges. These include lack of national data on type-specific HPV incidence, poor public awareness and attitudes toward HPV vaccination, complexities of vaccine introduction, and sociocultural issues related to HPV vaccines. A recent study in the United Kingdom to assess public knowledge about HPV and cervical cancer indicated that even in this developed country, the majority of participants had no knowledge about the problem or benefits of the vaccine [8]. A multifaceted and coordinated strategy would be needed to increase awareness and implementation of HPV vaccination programmes. Several international organizations such as PATH, International Agency for Research on Cancer, World Health Organization (WHO) and the Bill and Melinda Gates Foundation are playing an active role in introducing HPV vaccines in developing countries

The history of AIDS is a short one, but the consequences of the global AIDS epidemic has been nothing less than catastrophic. Since its first description in the 1980s among homosexual men in San Fransisco, USA, 25 million have fallen victim to the deadly virus, and millions are living with the HIV infection worldwide [9]. Table 1 indicates the latest statistics on the world epidemic of AIDS and HIV which were published by UNAIDS/ WHO in July 2008, and refer to the end of 2007 [10]. Regional statistics for HIV and AIDS show that among the global total of 33 million adults and children

living with HIV/AIDS, 22 million were in Sub-Saharan Africa. In three southern African countries national adult HIV prevalence rate now exceeds 20%. These countries are Botswana (23.9%), Lesotho (23.2%) and Swaziland (26.1%). A national survey conducted in 2004–2005 with 67,711 participants randomly recruited from across Libya showed that HIV prevalence among the general population had reached 0.67% in Alkoufra governorate in the south-east of the country, 0.4% in Tripoli compared with national prevalence of 0.13% [11]. Unlike the tremendous success achieved in developing the prophylactic vaccine against HPV, we are no nearer a cure and certainly years away from a vaccine against HIV [12]. Cost effective interventions such as male and female condom promotion, sex worker interventions, AIDS education in schools, voluntary counseling and testing, blood supply safety measures, encouraging partner reduction, and prevention of mother-to-child transmission can play a major role in containing the spread of this epidemic. The World AIDS day is observed every year on December 1st. The World Health Organization established World AIDS Day in 1988. The twentieth anniversary this year is another reminder for all of us to collectively work to raise awareness and focus attention on the global AIDS epidemic. From the bottom of our hearts let us thank the “virus hunters” for their great service to humanity and hope that their tribe grows to conquer these deadly pathogens.

9. Quinn TC. HIV epidemiology and the effects of antiviral therapy on long-term consequences. *AIDS* 2008; 22(Suppl 3):S7-12.
10. UNAIDS 2008 report on the global AIDS epidemic. Available at: <http://www.unaids.org> . Accessed on 22nd November, 2008.
11. El- Gadi S. Halting HIV epidemic in Libya: what can we do? Proceedings of the Scientific Conference on Infectious and Endemic Diseases organized by Libyan National Center for Infectious Diseases Protection and Control 4-7 May 2007, Tripoli, Libya. 12-13.
12. McBurney SP, Ross TM. Viral sequence diversity: challenges for AIDS vaccine designs. *Expert Rev Vaccines* 2008; 7(9):1405-1417.

**Table 1** Global HIV /AIDS estimates, end of 2007

	Estimate in millions	Range in millions
People living with HIV/ AIDS in 2007	33.0	30.3 – 36.1
Adults living with HIV/ AIDS in 2007	30.8	28.2 – 34.0
Women living with HIV/ AIDS in 2007	15.5	14.2 – 16.9
Children living with HIV/ AIDS in 2007	2.0	1.9 – 2.3
People newly infected with HIV in 2007	2.7	2.2 – 3.2
Children newly infected with HIV in 2007	0.37	0.33 – 0.41
AIDS deaths in 2007	2.0	1.8 – 2.3
Child AIDS deaths in 2007	0.27	0.25- 0.29

*UNAIDS/WHO in July 2008*

**References**

1. Hampton T. Nobel Prize honors HIV , HPV discoveries . *JAMA* 2008; 300 (18):2109
2. Cohen J, Enserink M . Nobel Prize in Physiology or Medicine. HIV, HPV researchers honored, but one scientist is left out. *Science* 2008; 322 (5899):174-175.
3. The Nobel Prize in Physiology or Medicine 2008. Press release 6th October 2008. Available at : <http://www.Nobelprize.org>. Accessed on 22nd November, 2008.
4. Barr E, Tamms G. Quadrivalent human papillomavirus vaccine. *Clin Infect Dis* 2007; 45(1):607–609.
5. Moscicki AB. HPV vaccines: today and in the future. *J Adolesc Health* 2008; 43(4 Suppl):S26- 40 .
6. Paavonen J, Lehtinen M. Introducing human papillomavirus vaccines-questions remain. *Ann Med* 2008; 40(3):162-166.
7. Rambout L, Hopkins L, Hutton B, Fergusson D. Prophylactic vaccination against human papillomavirus infection and disease in women: a systematic review of randomized controlled trials. *CMAJ* 2007; 177(5):469-479.
8. Walsh CD, Gera A, Shah M, Sharma A, Powell JE, Wilson S. Public knowledge and attitudes towards Human Papilloma Virus (HPV) vaccination . *BMC Public Health* 2008; 8:368-372.