

Melody Duvall....AIDS vaccine researcher

"During my Ph.D. training, I combined my interests in clinical medicine with investigations in the lab... learning from patients in Africa. Living in Africa where HIV is prevalent, yet access to medications and healthcare is limited, brought to light the disparity between the developed world and the undeveloped world. This program provided these unique experiences that have shaped my orientation to research and medicine...."



Melody Gayle Duvall grew up in Scottsboro, Alabama and slowly discovered her passion for experimental science during her college years as a dual major in Chemistry and Biology at the University of Alabama. After she graduated with honors in 2000, she first spent a summer at the Jackson Laboratories in Bar Harbor, Maine where she studied retroviruses in mice. Deferring medical school for a year, she then accepted a position as a postbaccalaureate research student in the laboratory of Michael Lenardo at the NIH where she worked on the molecular mechanisms by which HIV kills CD4 T lymphocytes thereby leading to AIDS. During this experience, she developed a growing awareness of the global health impact of AIDS particularly in areas of Africa and Asia which are least capable of fighting the epidemic. She developed a passion for health in developing countries and set her sights on making a direct impact on AIDS in these countries. After her first year of medical school, Melody and a classmate, Franklin Huang, organized an education program to combat AIDS. This program--*Students Teaching AIDS to Students*—was established in the Caribbean country of Dominica that was facing economic and social collapse due to the epidemic. See: <http://www.aegis.com/news/mh/2002/MH020811.html>.

For these reasons, she applied to the NIH-Oxford program to pursue a D. Phil. in experimental research directed at developing an AIDS vaccine. She undertook this work in the

laboratory of Dr. Richard Koup at the Vaccine Research Center, NIAID, NIH in Bethesda, Maryland and collaboratively with Professor Sarah Rowland-Jones at Medical Research Council (MRC) Human Immunology Unit, Weatherall Institute of Molecular Medicine and the John Radcliffe Hospital, Oxford. This also involved fieldwork at the MRC Research Unit in The Gambia, a tiny African country ravaged by AIDS. It was there that she tackled the question of why there was such a dramatic difference in clinical outcome for people infected with the two different HIV strains found in Africa – HIV-1 and HIV-2. HIV-2 is not typically seen in the United States but is very prevalent in West Africa.

See: <http://www.jimmunol.org/cgi/content/full/176/11/6973>

Melody recently extended this work by discovering that HIV-2 interacts differently with the immune system compared to HIV-1. See: <http://jvi.asm.org/cgi/content/abstract/JVI.00976-07v1?maxtoshow=&HITS=10&hits=10&RESULTFORMAT=&author1=duvall%2C+m&searchid=1&FIRSTINDEX=0&resourcetype=HWCIT>

Gambia, The



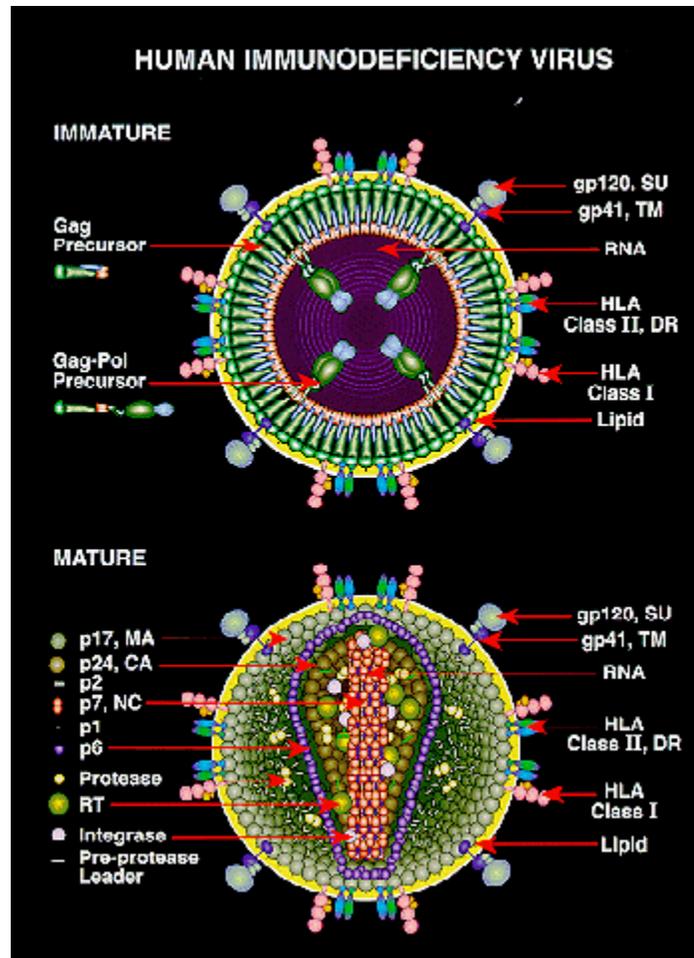
In her study, Melody demonstrated that HIV-2-infected subjects, especially those with preserved CD4⁺ T cell counts, are distinct from HIV-1-infected individuals in that they maintain a proliferation-competent, nonterminally differentiated, multiple cytokine-expressing HIV-specific CD4⁺ T cell response. This work provides important new insights into the immune correlates necessary for a successful HIV vaccine.



Vaccine Research Center, NIH



Prof. Sarah Rowland-Jones, Oxford



As Africa confronts the 21st century, several challenges remain. Some of the major challenges are in economic development and in health, the two being interrelated. According to WHO, an estimated 45 percent of the population lives below the poverty line, on less than \$1 (US) per day. WHO reports that in this region life expectancy is only 47 years, and people suffer from a wide range of diseases, several of which are the NIAID's highest priorities for research:

- The majority of cases of malaria each year occur in Africa, primarily in children under 5 years of age.
- HIV/AIDS has had a more devastating effect on Africa than on any other region of the world.
- Tuberculosis (TB) is a major cause of death among people living with HIV/AIDS, and Africa bears the brunt of the HIV-fueled TB epidemic.

- NIAID Report on its Global Research Program