

## BIOGRAPHICAL SKETCH

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NAME Yu, Qigui	POSITION TITLE Assistant Professor of Microbiology and Immunology
eRA COMMONS USER NAME yuqigui	

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)

INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
Wannan Medical College, Wuhu, China	M.D.	07/1986	Medicine
Fourth Military Medical University, Xian, China	M.S.	07/1989	Microbiology and Immunology
Fourth Military Medical University, Xian, China	Ph.D.	06/1995	Molecular Virology and Immunology

### A. Personal Statement

Research in my laboratory mainly focuses on the immunopathogenesis of HIV-1/AIDS. Infection with HIV-1 is characterized by both continual virus replication and a vigorous immune response. Antibodies (Abs) are elicited early in infection and are generally vigorous at all stages of HIV-1 infection. However, these Abs are unable to clear virus particles and infected cells by actions of the complement system, phagocytes or killer cells. Our research interests are to understand the molecular mechanisms by which HIV-1 virions or infected cells resist to Ab-dependent complement-mediated virolysis or cytolysis. The major areas of my current research are **(1)** Development of novel strategies to eradicate HIV-1 reservoirs. We have investigated the abrogation of regulators of complement activation (RCA) to facilitate HIV-1-specific Abs in patient plasma to lyse the complement-resistant HIV-1 virions. We are using this strategy to specifically kill latently HIV-1-infected cells after provirus reactivation in order to eradicate HIV-1 reservoirs. **(2)** Novel strategies to aid in vaccine design to enhance cellular immunity to persistent virus infection in immunocompromised hosts and aged individuals. We have incorporated the tumor necrosis factor (TNF) superfamily molecules including CD40L, RANKL, and Ox40L, pivotal costimulatory molecules for immune responses, into poxvirus vectors in order to test their adjuvant activity in enhancing immunogenicity of poxvirus-based HIV-1 vaccines. Co-immunization of mice with CD40L-expressing poxvirus and poxvirus-based HIV-1 vaccines augmented HIV-1 specific CTL responses in terms of frequency, polyfunctionality and IL-7 receptor alpha chain expression. We are particularly interesting in exploring the adjuvant activity of these constructs in enhancing immunogenicity of HIV-1 vaccines in CD4<sup>+</sup> T cell-deficient or aged murine models.

### B. Positions and Honors

#### Positions and Employment

1985 - 1986	Intern, Wuhu 2nd People's Hospital, Wuhu, Anhui, China
1986 - 1991	Teaching and Research Assistant, Department of Microbiology, Fourth Military Medical University, Xian, Shannxi, China
1995 - 1996	Visiting Scientist, Department of Tropical Medicine, University of Hawaii, Honolulu, Hawaii.
1995 - 1997	Instructor and Junior Researcher, Department of Etiology, Fourth Military Medical University, Xian, Shannxi, China
1997 - 2001	Junior Researcher, Retrovirology Research Laboratory, Pacific Biomedical Research Center, University of Hawaii at Manoa, Honolulu, Hawaii, USA.
2001 - 2004	Postdoctoral Fellow, Clinical Sciences Division, University of Toronto, Toronto, Ontario, Canada
2004 - 2005	Research Associate, Faculty Member, Clinical Sciences Division, University of Toronto, Toronto, Ontario, Canada
2005 - 2008	Assistant Professor, Department of Medicine, John A. Burns School of Medicine, University of Hawaii at Manoa, Honolulu, Hawaii, USA

2006 - 2008	Graduate Faculty serving in the field of Biomedical Sciences, Graduate Division, University of Hawaii at Manoa, Honolulu, Hawaii, USA
2007 - 2008	Director, Hawaii HIV Immunobiology and Vaccine Lab within the Hawaii AIDS Clinical Research Program, John A. Burns School of Medicine, University of Hawaii at Manoa.
2008 - present	Assistant Professor, Department of Microbiology and Immunology, Indiana University School of Medicine, Indianapolis, Indiana, USA.
2009 - present	Assistant Professor, Division of Infectious Diseases, Indiana University School of Medicine, Indianapolis, Indiana, USA.

### **Honors**

1991	Science and Technology Award from Chinese Army.
1992	Silver Prize in 92' Beijing International Exhibition of Inventions.
1994	Provincial Science and Technology Award from Shanxi Province of China.
1995 - 1997	UNDP/World Bank/WHO Special Program for Research and Training in Tropical Diseases (TDR) Award (M22/181/157 ID 950385).
1996 - 1998	Chinese National Natural and Scientific Foundation Award (ID 39570807).
1996 - 1998	Chinese National Natural and Scientific Foundation Award (ID 39500132).
2001 - 2003	Fellowship Award from the Ontario HIV Treatment Network, Canada.
2005 - 2007	Junior Investigator Development Award from the Ontario HIV Treatment Network, Canada.
2006	Junior Faculty Travel Award from the University of Hawaii at Manoa.
2006 - 2007	Idea Networks for Biomedical Research Excellent Mini Grant from University of Hawaii.
2006 - 2008	New Investigator Award from Center for AIDS Research at University of Washington.
2008	AAI Junior Faculty Travel Award from the American Association of Immunologists.
2006 - 2008	Medical Research Award from Hawaii Community Foundation.
2009	AAI Junior Faculty Travel Award from the American Association of Immunologists.
2010	AAI Junior Faculty Travel Award from the American Association of Immunologists.
2010	Travel grant by the International Congress of Immunology, Kobe, Japan.
2011	AAI Junior Faculty Travel Award from the American Association of Immunologists.
2011	Chair for the Block Symposium (Immune Regulation by Host-virus Interactions) of the American Association of Immunologists (AAI) Annual Meeting, May 13-17, 2011, San Francisco, CA.
2012	Travel grant from the 7th International Symposium on Alcoholic Liver and Pancreatic Diseases and Cirrhosis, Beijing, China, 2012.
2013	2013 Trustee Teaching Award, Indiana University.

### **Professional Memberships:**

Member, American Society for Virology, 2001  
Member, American Association of Immunologists, 2001

### **C. Selected Peer-reviewed Publications**

1. **Yu Q.**, Gu JX., Kovacs C., Freedman J., Thomas EK., Ostrowski MA. Cooperation of TNF Family Members CD40 Ligand, Receptor Activator of NF-kappaB Ligand, and TNF-alpha in the Activation of Dendritic Cells and the Expansion of Viral Specific CD8(+) T Cell Memory Responses in HIV-1-Infected and HIV-1-Uninfected Individuals. **The Journal of Immunology**. 2003; 170(4):1797-1805. PMID: 12574344
2. **Yu Q.**, Kovacs C., Yue FY., Ostrowski MA. The Role of the p38 MAPK, ERK, and PI3K Signal Transduction Pathways in CD40L induced Dendritic Cell Activation and Expansion of Virus Specific CD8+ T Cell Memory Responses. **The Journal of Immunology**. 2004; 172(10): 6047-6056. PMID: 15128788
3. **Yu Q.**, Yue FY., Gu XX., Schwartz H., Kovacs CM., Ostrowski MA. OX40 ligation of CD4+ T cells enhances virus-specific CD8+ T cell memory responses independently of IL-2 and CD4+ T regulatory cell inhibition. **The Journal of Immunology**. 2006; 176(4): 2486-95. PMID: 16456009
4. **Yu Q.**, Jones B., Hu N., Chang H., Ahmad S., Liu J., Parrington M., Yewdell J., Ostrowski MA. Comparative analysis of tropism between Canarypox (ALVAC) and Vaccinia viruses reveals a more restricted and preferential tropism of ALVAC for human cells of the monocytic lineage. **Vaccine**. 2006; 24(40-41):6376-91. PMID: 16859816
5. Ostrowski MA., **Yu Q.**, Yue FY., Liu J., Jones B., Gu XX., Loutfy M., Kovacs CM., Halpenny R. Why can't the immune system control HIV-1? Defining HIV-1-specific CD4+ T cell immunity in order to develop strategies to enhance viral immunity. **Immunol Res**. 2006; 35(1-2): 89-102. PMID 17003512

6. **Yu Q.**, Chow E., Wong H., Gu J., Mandelboim O., Gray-Owen S., Ostrowski MA. CEACAM1 (CD66A) promotes human monocyte survival via a phosphatidylinositol 3-kinase and AKT-dependent pathway. *J Biol Chem*. 2006 Dec 22;281(51):39179-93. PMID: 17071610
7. **\*\*Liu J.**, **\*\*Yu Q.**, Stone GW., Yue FY., Ngai N., Jones RB., Kornbluth RS., Ostrowski MA. CD40L expressed from the canarypox vector, ALVAC, can boost immunogenicity of HIV-1 canarypox vaccine in mice and enhance the in vitro expansion of viral specific CD8(+) T cell memory responses from HIV-1-infected and HIV-1-uninfected individuals. *Vaccine*. 2008 Jul 29;26(32):4062-72. (\*\*Co-first authors). PMID: 18562053
8. Hu N., Yu R., Shikuma C., Shiramizu B., Ostrowski, MA., **Yu Q.** Role of cell signaling in poxvirus-mediated foreign gene expression in mammalian cells. *Vaccine*. 2009; 27 (22):2994-3006. PMID: 19428911
9. Song Y., Zhuang Y., Zhai S., Huang D., Zhang Y., Kang W., Li X., Liu Q., **Yu Q.**, Sun Y. Increased expression of TLR7 in CD8(+) T cells leads to TLR7-mediated activation and accessory cell-dependent IFN-gamma production in HIV type 1 infection. *AIDS Res Hum Retroviruses*. 2009 Dec;25(12):1287-95. PMID: 19954299
10. Hu W., **\*\*Yu Q.**, Hu N., Byrd D., Shikuma C., Shiramizu B., Halperin JA., Qin X. A high-affinity inhibitor of human CD59 enhances antibody-dependent complement-mediated virolysis of HIV-1. *The Journal of Immunology*, 2010; 184: 359–368 (\*\*Co-first authors and Co-corresponding authors). PMID: 19955519
11. Zinin PVA., Kamemoto L., **Yu Q.**, Hu N., Sharma SK. Visible, nearinfrared and UV laser-excited Raman spectroscopy of the monocytes/macrophages (U937) cells. *J. Raman Spectrosc*. 2010, 41, 268–74
12. **Yu Q.**, Yu R., Qin X. The good and evil of complement activation in HIV-1 infection. *Cell Mol Immunol*. 2010, 7: 334 – 340. PMID: 20228834
13. Chi X., Amet T., Byrd D., Shah K., Hu S., Grantham A., Duan J., **Yu Q.** Direct effects of HIV-1 Tat protein on excitability and survival of primary dorsal root ganglion neurons: possible contribution to HIV-1-associated pain. *PLoS ONE*, 2011, 6(9): e24412. PMCID: PMC3166319
14. Amet T., Ghabril M., Chalasani N., Byrd D., Hu N., Grantham A., Liu Z., Qin X., He JJ., **Yu Q.** CD59 incorporation protects hepatitis C virus from complement-mediated destruction. *HEPATOLOGY*, 2012, 55 (2): 354-363. PMID: 21932413.
15. **\*\*Yu Q.**, Chow E., McCaw S., Hu N., Byrd D., Amet T., Hu S., Ostrowski M., Gray-Owen S. Association of Neisseria gonorrhoeae OpaCEA with Dendritic Cells Suppresses Their Ability to Elicit an HIV-1-Specific T Cell Memory Response. *PLoS ONE* 2013, 8(2):e56705.doi:10.1371/journal.pone.0056705 (\*\*Corresponding author as well).

#### Book (2009)

Book Title: Viral Application of GFP  
 Book Editor: Barry W. Hicks, Ph.D  
 Chapter 22 author: **Yu Q.**  
 Publisher: Humana Press Inc.

#### Book (2012)

Book Title: Apoptosis  
 Book Editor: Justine Rudner, Ph.D  
 Chapter Authors: Desai M., Hu N., Byrd D., **Yu Q.**  
 Publisher: InTech (www.intechopen.com)

#### D. Research Support:

##### Ongoing Research Support

1R21R33AI104268-01                      Yu Q. (PI)              01/01/2013 – 12/31/2017  
 NIAID/NIH

**Project:** Specific killing of latently HIV-1-infected cells after provirus reactivation

**The major goal** of this project is to use ACH-2 cells, a well-characterized cell model of HIV-1 latency, to develop an “activation-killing” approach to eliminate latently HIV-1-infected cells.

**Role:** PI

**Note:** This is an R21/R33 grant from NIAID/NIH. Current funding is for the R21 phase.

Award ID#: OPP1035237                      Yu Q. (PI)              09/30/2011 - 09/30/2014 (no cost one-year extension)  
 Bill & Melinda Gates Foundation

**Project:** A novel therapeutic strategy to eradicate HIV-1 infection

**The major goal** of this project is to determine whether abrogation of the function of regulators of complement activation can render HIV-1 virions and infected cells sensitive to complement attack.

**Role:** PI

**Note:** This is the Grand Challenges Explorations (GCE) Phase II grant from the Bill & Melinda Gates Foundation.

1 U01 AA021840-01 Crabb D. (PI) 09/01/2012 – 08/31/2017

NIAAA/NIH

**Project:** Translational Research and Evolving Alcoholic hepatitis Treatment (TREAT)

**The major goal** of this project is to conduct translational studies in humans to better understand alcoholic hepatitis (AH) pathogenesis and to develop novel treatments.

**Role:** Co-investigator and director of the Core of Clinical Immunology

R01HL095135-01 Shikuma C. (PI) 09/25/2008 – 06/30/2013

NLHI/NIH

**Project:** Role of oxidative stress and inflammation in HIV cardiovascular risk

**The major goal** of this project is to evaluate mitochondrial oxidative stress in PBMCs of HIV patients relative to cardiovascular risk.

**Role:** Subcontract PI

CTIS Award Samir Gupta (PI) 06/01/2012 – 05/31/2013

Indiana Clinical and Translational Sciences Institute

**Project:** Periodontitis and bacterial translocation in HIV

**The major goal** of this project is to determine the changes in bacterial translocation, systemic inflammation, and immune activation in antiretroviral-treated, HIV-infected patients undergoing periodontal therapy.

**Role:** Co-PI

#### **Pending**

1R01AI106615-01 Yu Q. (PI) 08/01/2013 – 07/31/2016

NIAID/NIH

**Project:** An immune-based approach for elimination of HIV-1 reservoirs

**The major goal** of this project is to develop an immune-based approach to simultaneously combat residual viremia and latently infected cells in HIV-1-infected patients on suppressive antiretroviral therapy (ART) towards an HIV-1 cure.

**Note:** This R01 application has been reviewed and received a fundable impact score, which is pending for a possible funding.

#### **Completed Research Support**

R21AI073250 Yu Q. (PI) 09/15/2007 - 08/31/2010

NIAID/NIH

**Project:** Development of Molecular Adjuvants for Therapeutic HIV-1 Vaccines

**The major goal** of this project is to develop molecular adjuvants to improve immunogenicity of HIV-1 vaccines.

**Role:** PI

Award #53183 Yu Q. (PI) 05/01/2009 - 04/30/2010

Bill & Melinda Gates Foundation

**Project:** A novel therapeutic strategy to eradicate HIV-1 infection

**The major goal** of this project is to determine whether abrogation of the function of complement activation proteins can render HIV-1 virions and infected cells sensitive to complement attack.

**Role:** PI

**Note:** *This is the Grand Challenges Explorations (GCE) Phase I grant from the Bill & Melinda Gates Foundation.*

Showalter Research Award Yu Q. (PI) 07/01/2009 – 06/30/2010

Showalter Research Trust Fund

**Project:** The role of intrahepatic IL-17/Th17 cells in the pathogenesis of accelerated liver disease in HCV/HIV-1 coinfection

**The major goal** of this project is to investigate the role of intrahepatic IL-17/Th17 cells in the pathogenesis of accelerated liver disease in HCV/HIV-1 coinfection.

**Role:** PI