Ratish Gambhira, DVM, MS, PhD, DACVM

T32 Research Fellow
Department of Microbiology
Tulane National Primate Research Center
Covington, LA- 70433

Cell: 985-377-4545
Home: 985-221-4875
rgambhir@tulane.edu

Immigration status: Permanent Resident

Education

Institution	Degree	MM/Year	Field of Study
Tulane University, LA	PhD	05/2012	Microbiology
Indian Veterinary Research Institute, India	MS	12/1997	Biotechnology
College of Veterinary Sciences, India	DVM	03/1994	Veterinary Sciences

Certification

- Diplomate, American College of Veterinary Microbiologists (ACVM) in Virology

Awards and Patents

2009 Presented with Beginning Scientist Award from Tulane University
2006 Won an award for Excellence in Basic Research at Eighth Annual Pathology Young investigators' Day held in Johns Hopkins University
2006 Awarded NCI travel scholarship to present the work at DNA tumor virus meeting in San Diego, CA
2005 Won an award for Excellence in Basic Research at Seventh Annual Pathology Young investigators' Day held in Johns Hopkins University
1995 Awarded Department of Biotechnology fellowship for Master's research Program

- Co-inventor on a patent filed on "Papillomavirus N-terminal peptides for the induction of broadly cross neutralizing antibodies"
- Co-inventor of the "RG-1 Monoclonal Antibody" that could neutralize both human papillomavirus (HPV) 16 and 18 infections in vitro
- Co-inventor on the L2 based Lipopeptide vaccine for prevention of HPV infection

Professional Experience

- **August 2009-Present**: NRSA (T32) Research Fellow, Tulane National Primate Research Center, Covington, LA. Job details: completed PhD on a project titled "*Studying the envelope sequences and cytokine responses among rhesus macaques vaccinated with VSV expressing SIV proteins and challenged with SIVsmE660".* Performed several molecular biology techniques such as site directed mutagenesis, isolation of viral nucleic acids and single genome amplification technique (SGA). Also conducted extensive cytokine analysis along with ELISA assays for estimating the viral titers. Also, identified unique sequences from envelope region of simian immunodeficiency virus (SIV) that are responsible for viral pathogenesis *in vivo*.

- **March 2008-August 2009**: Postdoctoral Fellow, Tulane National Primate Research Center, Covington, LA. Job details: worked on a project aimed at "*Understanding the pathogenesis of mycobacterium tuberculosis Sig H mutant in rhesus macaques".* The project involved performing techniques related to fluorescent activated cell sorting (FACS), Confocal microscopy for analyzing the blood and tissue samples from m*ycobacterium tuberculosis* infected macaques in the BSL-3 containment facility.

- **September 2002-February 2008**: Postdoctoral Fellow, Johns Hopkins University, Baltimore, MD. Project details: "*Developing of L2 based prophylactic vaccines against Human papillomavirus (HPV) infection and understanding the role of L2 protein in viral infection"*. I developed a broadly protective protein and peptide based vaccines against cervical cancer. I also discovered a novel Monoclonal antibody (RG-1) that protected against HPV infection both in vitro and in vivo (mouse model). Further, I also developed a mouse model for HPV16 infection. Finally, I performed extensive work on understanding the mechanism of papillomavirus entry into the susceptible cells.
- **August 2001-Spetember 2002**: Postdoctoral Fellow, MD Anderson cancer center, Houston, TX. Job details: I worked on a project focused on "*studying the safety and potential of cholera toxin mutant as a novel mucosal adjuvant"*. This work involved using a novel adjuvant in combination with peptides derived from both HIV and HPV for eliciting T and B cell responses in mouse models.
- **June 2000-August 2001**: Research Trainee, MD Anderson cancer center, Bastrop, TX. Job details: collected several blood samples form HPV infected patients and analyzed their immune response to E6 and E7 derived peptides using ELISPOTs, FACS and T cell proliferation assays.
- **June 1998-May 2000**: Scientist, Syngene International Pvt Ltd., Bangalore, India. Job duties: the work involved developing highly permeable strains of *E.coli* using gene replacement methodologies and also optimizing methods for yeast transfection.
- **January 1998-June 1998**: Research Associate, Post Graduate Institute of Medical Education and Research, Chandigarh, India. Project: Role of RcK receptors in Leukemia.
- **August 1994-December 1997**- Indian Veterinary Research Institute, Bangalore, India. Master's thesis: " Development of recombinant protein based ELISA kits for detection of foot and mouth disease virus (FMDV) serotypes".

Professional Affiliations

- American Association for Cancer Research
- American College of Veterinary Microbiologists
- International Papillomavirus society
- Veterinary Council of India

Peer Reviewer: I am a reviewer on *veterinary immunology and immunopathology*, *Virus Genes* and *Journal of Medical Primatology*.

Grants submitted

KO1 grant: Role of high mobility group box (HMGB) 1, its receptors and associated cytokines as mediators of SIV pathogenesis-October 12th, 2012

Publications

1. **Gambhira R** et al., SGA analysis of viral envelope sequences in VSV-SIV vaccinated and SIVsmE660 challenged rhesus macaques (in preparation)
2. **Gambhira R** et al., Characterization of cytokine responses in VSV-SIV vaccinated, protected macaques and chronically SIV infected macaques. (in preparation)
3. Schell JB, Rose NF, Bahl K, Diller K, Buonocore L, Hunter M, Marx PA, **Gambhira R**, Tang H, Montefiori DC, Johnson WE, Rose JK (2011). Significant protection against high-dose simian immunodeficiency virus challenge conferred by a new prime-boost vaccine regime. *J.Virol*. 85(12): 5764-72.
4. **Gambhira R**, Jagu S, Karanam B, Day PM, Roden R (2009). Role of L2 cysteines in papillomavirus infection and neutralization. *Virol J*
5. Jagu S, Karanam, B, **Gambhira R**, Chivukula SV, Chaganti R, Schiller JT and Roden RBS (2009). Concatenated Multi-type L2 Fusion Protein as a Prophylactic Human Papillomavirus Vaccine. *Journal of the National Cancer Institute*. Jun 3; 101(11): 782-92. Epub 2009 May 26
6. Zhenhua Lin **Gambhira R**, Jagu S, Kirnbauer R, Meyers C and Roden RBS (2009). Sub cellular localization of Human papillomavirus minor capsid protein L2 differs upon ectopic versus endogenous expression. *American Journal of Pathology*. Jan; 174(1): 136-43
7. Handisurya A, **Gambhira R**,Schellenbacher C,Shafti-Keramat S, Forslund O, Favre M, Kirnbauer R (2009). Serological relationship between cutaneous human papillomavirus types 5, 8 and 92. *Journal of General Virology*. Jan; 90(Pt 1): 136-43.
8. Karanam B, **Gambhira R**, Roberts JN, Peng S, Jagu S, Kim D, Ketner G, Adams R, Roden RBS (2009). Vaccination with TA-CIN (L2E6E7) and semi-synthetic quillaja saponin analog GPI-0100 elicits protective humoral and tumor immunity. *Vaccine*. Feb 11; 27(7): 1040-9.
9. Alphs H*, **Gambhira R***, Karanam B, Roderts JN, Jagu S, Schiller JT, Zeng W, Jackson DC, Roden RBS (2008). A synthetic lipopeptide vaccine containing a broadly cross-neutralizing epitope of minor capsid protein L2 protects against heterologus human papillomavirus challenge. (*both the authors contributed equally). *Proceedings of the National Academy of Sciences.* Apr; 105(15): 5850-5.
10. Day PM, Gambhira R, Roden R, Lowy DR, Schiller JT (2008). Mechanism of HPV 16 Neutralization by L2-cross neutralizing and L1 type-specific antibodies. *J.Virol*. May; 82(9): 4638-46.
11. Kim D, **Gambhira R,** Karanam B, Monie A, Hung CF, Roden R, Wu TC (2008). Generation and Characterization of a preventive and therapeutic HPV DNA *Vaccine*. Jan; 26(3): 351-60.
12. **Gambhira R**, Karanam B, Jagu S, Roberts J, Buck CB, Bossis I, Alphs H, Culp T, Christensen ND, Roden RB (2007). A protective and broadly cross-neutralizing epitope of Human papillomavirus L2. *J Virol.* Dec; 81(24): 13927-31
13. **Gambhira R,** Jagu S, Karanam B, Gravitt PE, Culp TD, Christensen ND, Roden RB (2007). Protection of rabbits against challenge with rabbit papillomaviruses by immunization with the N-terminus of HPV16 minor capsid antigen L2. *J Virol*. Nov; 81(21): 11585-592.
14. Manuri PR, Nehete B, Nehete PN, Reisnauer R, Wardell S, Courtney AN, **Gambhira R**, Lomada D, Chopra AK, Jagannadha Sastry K (2007). Intranasal immunization with synthetic peptides corresponding to E6 and E7 oncoproteins of human papillomavirus type16 induces systemic and mucosal cellular immune responses and tumor protection. *Vaccine.* Apr; 25(17): 3302-10

15. **Gambhira R**, Gravitt PE, Bossis I, Stern PL, Viscidi RP, Roden RBS (2006). Vaccination of healthy volunteers with Human papillomavirus type 16 L2E7E6 fusion protein induces serum antibody that neutralizes across papillomavirus species. *Cancer Research*. Dec; 66(23): 1-4.
16. Slupetzky K, **Gambhira R**, Culp TD, Shafti-KeramatS, Schellenbacher C, Christensen ND, Roden RBS, Kirnbauer R (2006). A papillomavirus-like particle (VLP) vaccine displaying HPV16L2 epitopes induces cross-neutralizing antibodies to HPV11. *Vaccine* March; 25(11): 2001-10.
17. Berg M, **Gambhira R**, Siracusa M, Hoiczyk E, Roden R, Ketner G (2006). HPV16 L1 capsid protein expressed from viable adenovirus recombinants elicits neutralizing antibody in mice. *Vaccine*. Apr; 25(17): 3501-10.
18. Bossis I, Roden RB, **Gambhira R,** Yang R, Tagaya M, Howley P, Meneses PI (2005). Interaction of tSNARE syntaxin 18 with the papillomavirus minor capsid protein mediates infection. *J Virol.* Jun; 79(11): 6723-31.
19. Pastrana DV, **Gambhira R**, Buck CB, Pang YYS, Thompson CD, Lowy DR, Schiller JT and Roden RB (2005). Cross-neutralization of cutaneous and mucosal Papillomavirus types with anti-sera to the amino terminus of L2. *Virology.* Jul; 337(2): 365-372.
20. Lomada D, **Gambhira R**, Nehete PN, Guhad FA, Chopra AK, Peterson, JW, Sastry KJ (2004). A two-codon mutant of cholera toxin lacking ADP-ribosylating activity functions as an effective adjuvant for eliciting mucosal and systemic cellular immune responses to peptide antigens. *Vaccine*. Dec; 23 (4): 555-65
21. Nehete PN**, Gambhira R,** Nehete BP, Sastry KJ (2003)**.** Dendritic cells enhance detection of antigen-specific cellular immune responses by lymphocytes from rhesus macaques immunized with an HIV envelope peptide cock tail vaccine. *J Med Primatol*. Apr; 32(2): 67-73
22. Sastry KJ, Nehete PN, **Gambhira R**, Nehete BN, Keeney TS. (2001). Synthetic peptide-based vaccines for induction of cell-mediated immunity against human immunodeficiency virus (HIV) and human papillomavirus (HPV). *Recent Res. Devel. Virol.* 3: 575-601.
23. Suryanarayana V.V.S, Viswanathan S, **Ratish G**, Pradeep Bist, Prabhudas K, Gajendragad M.R., and Natarajan C. (1999*): E-coli* expressed proteins as diagnostic reagents for typing of foot and mouth disease virus. *Archives of Virology.* 144(9): 1701-12
24. **Ratish G**, Viswanathan S, Reddy G.R, Suryanarayana V.V.S. (1999). Type specific protein antigens of foot-and-mouth disease virus: Expression in *E-coli* and affinity purification. *Acta Virol*. Aug; 43(4): 205-11.
25. Viswanathan S, **Ratish G**, Reddy G.R, Suryanarayana V.V.S. (1999): Comparative studies of immuno reactivity of truncated recombinant proteins of FMDV produced in *E-coli* and insect cells. *Ind. J. Exp. Biol*. Jun; 37(6): 536-40.

Presentations

1. **Gambhira R**, Schell J, Hunter M, Rose J and Marx PA (2010). Study of vaccine induced cytokine response and viral characterization by SGA of VSV vaccinated macaques. Poster presented at Non-Human Primate models for AIDS, October 19-22, New Orleans.
2. **Gambhira R**, Jagu S, Karanam B, Day PM, Roden R (2009). Role of L2 cysteines in infection and neutralization by RG-1. To be presented at 25th International papilloma Conference, Malmo, Sweden.
3. **R Gambhira**, S Mehra, S Lebreton, AA Lackner, D Kaushal (2009). In Vitro study of effect of Mycobacterium and its isogenic *sigH* mutant on immune function of Dendritic cells. Presented at Tulane Research Days on Feb11-12.
4. Lin Z, **Gambhira R**, Jagu S, Kirnbauer R, Meyers C and Roden RBS (2007). Sub cellular localization of Human papillomavirus minor capsid protein L2 differs upon

ectopic versus endogenous expression. Presented at 24th International papilloma Conference, Beijing, China.

5. Jagu S, Karanam B, Malandro N**, Gambhira R** and Roden R (2007)**.** Multitype L2 Fusion Protein as a Second Generation Prophylactic Human Papillomavirus Vaccine. Presented at 24th International papilloma Conference, Beijing, China.
6. Day PM, **Gambhira R**, Roden R, Lowy D and Schiller JT (2007*).* Conformational changes of the HPV16 capsid on the cell surface revealed by furin cleavage and neutralization by anti-L2 antibodies.
7. **Gambhira R**, Buck C, Bossis I, Alphs H, Culp T, Christensen ND and Roden RB (2006). Cross protection of rabbits against challenge with rabbit papillomaviruses by immunization with the N-terminus of HPV 16 minor capsid protein antigen L2. Presented at 23rd International papilloma Conference, Prague, Czech Republic.
8. **Gambhira R**, Gravitt P, Bossis I, Stern PL, Viscidi R and Roden RB (2006). Vaccination of healthy volunteers with HPV16L2E6E7 fusion protein induces cross-clade neutralizing serum antibody. Presented at 23rd International papilloma Conference, Prague, Czech Republic.
9. **Gambhira R**, Buck C, Bossis I, Alphs H, Culp T, Christensen ND and Roden RB. A highly conserved neutralizing epitope of L2 critical to human papillomavirus infection and immunogenic in patients. Presented at DNA tumor virus meeting, San Diego, CA.
10. **Gambhira R**, Alphs H, Bossis I, Culp T Christensen NDand Roden RB (2006). Cross protection of rabbits against challenge with rabbit papillomaviruses (CRPV/ROPV) by immunization with minor capsid protein antigen, L2. Presented at Young Investigator's Day in the Department of Pathology at Johns Hopkins University.
11. **Gambhira R**, Bossis I and Roden R (2005). A novel broadly cross neutralizing epitope of Human papillomavirus (HPV) 16 L2. Presented at Young Investigator's Day in the Department of Pathology at Johns Hopkins University.
12. **Gambhira R**, Bossis I and Roden R. (2004). A novel broadly cross-neutralizing epitope of Human Papillomavirus (HPV) 16 L2 that overlaps a surface binding motif*.* Given a platform presentation at 22nd International Papilloma conference, Vancouver, Canada.
13. **R Gambhira**, I Bossis, RP Viscidi and RBS Roden (2004). Cross-neutralizing immune response of patients vaccinated with Human Papillomavirus (HPV) 16 minor capsid protein L2.Poster presentation at 22nd International Papilloma conference, Vancouver, Canada
14. **Gambhira R**, Bossis I and Roden R. (2004). A novel broadly cross-neutralizing epitope of Human Papillomavirus (HPV) 16 L2 that overlaps a surface binding motif*.* This work presented by my Principal Investigator Dr. Roden at structural basis of Papovavirus in Sienna, Italy.
15. V.V.S.Suryanarayana, S.Viswanathan **Ratish G**. Pradeep Bist and C.Natarajan (1998): Truncated Cterminal 16 kD VP1 of Foot-and-Mouth disease virus produced in heterologus host as the type specific diagnostic reagent*,* Proceedings of II Pan Commonwealth Veterinary Conference, February 1998, Bangalore.
16. V.V.S.Suryanarayana, S.Viswanathan, **Ratish, G** Pradeep Bist, M.R.Gajendragad, G.R.reddy and C.Natarajan (1997): Purified E-coli expressed antigens of Foot-and-Mouth disease virus in specific diagnostic reagents, in 12th annual convention and conference of Indian Virological Society, GAU 1-3, August, 1997.