

Ebenezer Tumban, Ph.D.  
1400 Townsend Dr, Dow740  
Houghton, MI 49931  
Phone: 906 487 2256  
Email: etumban@mtu.edu

## EDUCATION

2007	Ph.D.	Molecular Biology, New Mexico State University, Las Cruces, NM
2003	M.S.	Biology, New Mexico Highlands University, Las Vegas, NM
1999	B.S.	Biochemistry, with a minor in Medical Lab Technology, University of Buea

## PROFESSIONAL POSITIONS

2014-present	Assistant Prof. of Virol. & Vaccinology	Michigan Technological University
2016-present	Visiting Adj. Assist. Prof.	University of NM School of Medicine
2011-2014	Research Scientist	University of NM School of Medicine
2010-2011	Postdoctoral Fellow	University of NM School of Medicine
2008-2009	Postdoctoral Fellow	Research & Development, CTK Biotech
2003-2007	Teaching Assistant	New Mexico State University
2001-2003	Teaching Assistant	New Mexico Highlands University

## PUBLICATIONS

Basu R., Zhai L., Contreras A., and **Tumban E.** (2018). Immunization with Phage Virus-like Particles Displaying Zika Virus B-cell Epitopes Neutralizes Zika Virus Infection of Monkey Kidney Cells. Vaccine, In Press.

Zhai L., Peabody J., Pang YS., Schiller J., Chackerian B., and **Tumban E.** (2017). A novel candidate MS2 phage VLP vaccine displaying a tandem HPV L2 peptide offers similar protection in mice to Gardasil-9. Antiviral Research 147:116-123.

Peabody J., Muttill P., Chackerian B., and **Tumban E.** (2017). Characterization of a spray-dried candidate HPV L2-VLP vaccine stored for multiple years at room temperature. Papillomavirus Research 3:116-120.

Basu R. and **Tumban E.** (2016). Zika Virus on a Spreading Spree: what we now know that was unknown in the 1950's. BMC Virology Journal 13(165):1-9

Zhai L. and **Tumban E.** (2016). Gardasil-9: A global survey of projected efficacy. Antiviral Research 130:101-109

Saboo S., **Tumban E.**, Peabody J., Wafula D., Peabody D., Chackerian B., and Muttill P. (2016). Optimized Formulation of a Thermostable Spray-Dried Virus-Like Particle Vaccine against Human Papillomavirus. Molecular Pharmaceutics 13(5):1646–1655

**Tumban E.**, Muttill P., Escobar C., Peabody J., Wafula D., Peabody D., and Chackerian B. (2015). Preclinical refinements of a broadly protective VLP-based HPV vaccine targeting the minor capsid protein, L2. Vaccine 33(29):3346-53.

Tyler M., **Tumban E.**, Dziduszko A., Ozbun M., Peabody D., and Chackerian B. (2014). Immunization with a consensus epitope from human papillomavirus L2 induces antibodies that are broadly neutralizing. *Vaccine* 32(34):4267-74.

Tyler M., **Tumban E.**, Peabody D., and Chackerian B. (2014). The use of hybrid virus-like particles to enhance the immunogenicity of a broadly protective HPV vaccine. *Biotechnology and Bioengineering* 111(12):2398-406.

Tyler M., **Tumban E.**, and Chackerian, B. (2013). Second-generation prophylactic HPV Vaccines: Successes and challenges. *Expert Review of Vaccines* 13(2):247-55.

**Tumban E.**, Peabody J., Peabody D., and Chackerian B. (2013). A Universal Virus-Like Particle-based Vaccine for Human Papillomavirus: Longevity of Protection and Role of Endogenous and Exogenous Adjuvants. *Vaccine* 31(41):4647-54.

**Tumban E.**, Maes N., Schirtzinger E., Young K., Hanson C., Whitehead S., and Hanley K. (2013). Replacement of conserved or variable sequences of the mosquito-borne dengue virus 3' untranslated region with homologous sequences from Modoc virus does not change infectivity for mosquitoes. *Journal of General Virology* 94(4):783-8.

**Tumban E.**, Peabody J., Tyler M., Peabody D., and Chackerian B. (2012). VLPs Displaying a Single L2 epitope Induce Broadly Cross-neutralizing Antibodies Against Human Papillomavirus. *PLoS One* 7(11): e9751.

**Tumban E.**, Peabody J, Peabody D. and Chackerian B. (2011). A pan-HPV vaccine based on bacteriophage PP7 VLPs displaying broadly cross-neutralizing epitopes from the HPV minor capsid protein, L2. *PLoS One* 6(8): e23310.

Hunter Z, **Tumban E.**, Dziduszko A., and Chackerian B. (2011). Aerosol delivery of Virus-like particles to the genital tract induces local and systemic antibody responses. *Vaccine* 29(28):4584-92.

**Tumban E.**, Maes N., Mitzel D., Hanson C., Whitehead S., and Hanley K. (2011). Replacement of the 3' untranslated variable region of the mosquito-borne dengue virus with that of tick-borne Langat virus does not alter vector specificity. *Journal of General Virology* 92(4):841-8.

**Tumban E.**, Painter J., and Lott W. (2009). Comparison between the HCV IRES Domain IV RNA and the Iron Responsive Element. *Journal of Negative Results in BioMedicine* 8(4).

Romero T., **Tumban E.**, Jun J., Lott W., and Hanley K. A. (2006). Secondary structure of dengue virus type 4 3' untranslated region: impact of deletion and substitution mutations. *Journal of General Virology* 87(11):3291-6.

## PATENT

Bryce Chackerian, David Peabody, and **Ebenezer Tumban**. Immunogenic HPV L2-containing VLPs and related compositions, constructs, and therapeutic methods. United States Patent No. 9,717,783

and Japanese Patent No. 6185932. MS2-L2 VLPs is a candidate human papillomavirus prophylactic vaccine (AX03) licensed to Agilvax Biotech.

## GRANTS AND AWARDS

1R15 DE025812-01A1 (NIH-NIDCR): Development of a Multi-epitope L2 Bacteriophage VLPs Vaccine to Enhance Protection against Oral HPV Infections in HIV patients. September 2016 - September 2019. \$475,197

**Role: Principal Investigator**

Mi-Kickstart Award: Immunization with Phage Virus-like Particles Displaying Zika Virus B-cell Epitopes to Assess Zika Virus Protection in Mice. January 2018 - January 2019

\$14,250 (direct cost)

**Role: Principal Investigator**

Named the National Academies Fellow in Life Sciences for 2016-17 academic year by the National Academies in Washington, DC

Travel award recipient of the 27<sup>th</sup> International Papillomavirus Conference and Clinical Workshop in Berlin, Germany (2011). \$1,000

## TEACHING

### Courses at Michigan Technological University

- General Microbiology (BL 3210)
- Cancer Biology (BL 4752/ BL 5752)
- Medical Mycology and Virology (BL 3220)
- Modern Biochemistry and Molecular Biology Laboratory (BMB 6030)

### Guest Lectures

Michigan Technological University, Houghton, MI

- Biochemistry Orientation (BL 1800): Fall 2014, 2015, 2016, 2017
- Current Health Issues (BL 3970): Spring and Summer 2017
- Introduction to Biological Sciences (BL 1580): Fall 2017
- Advanced Molecular Biology (BMB 6020): Spring 2015

University of New Mexico School of Medicine, Albuquerque, NM

- Immunobiology (BioMed 514): Spring 2014

Fall 2013: Course facilitator/tutor, University of New Mexico School of Medicine, Albuquerque, NM  
-*Immunology blocks* for first-year medical students

### **Teaching Assistant**

2003-2007: Teaching assistant, New Mexico State University, Las Cruces, NM

**-Cellular & Organismal Biology lab sessions (science majors and non-science majors), Organic Chemistry lab sessions (science majors)**

2001-2003: Teaching assistant, New Mexico Highlands University, Las Vegas, NM

**-Microbiology (science majors) and General Biology (science and non-science majors) lab sessions, Anatomy & Physiology lab sessions (science and non-science majors)**

**-Prepped for Biotechnology lab sessions.**

## **MENTORING**

### **Ongoing**

Dana Anderson

Rupsa Basu

Elizabeth Bruckner

Brenna Rosso

Yvelande Zephyr

Lukai Zhai

### **Past students**

#### Graduate

Tahiyat Alothaim

#### Undergraduates

Lindsey Schenten: Summer 2017

Mary Tedeschi: Fall 2016 - Spring 2017

Audri Mills: Fall 2016 - Spring 2017

Alexandra VanSumeren: Fall 2016

Kambrie Bomgaard: Summer 2016

Justin Workman: Fall 2015 - Spring 2016

Alice Contreras: Fall 2015 - Spring 2017

Danielle Dawson: Fall 2014 - Spring 2015

Damon Stafford: Fall 2014 - Spring 2015

Parissha Louis: Spring 2015

Pedro Rodriguez: Spring 2015

Andrea A. Escobar: Fall 2012 - Spring 2013

Leigh Cooper: Fall 2005 – Spring 2007

Jenna Painter: Fall 2004 – Spring 2005

Leo Castro: Summer 2002

### **CURRENT GRADUATE STUDENT ADVISING COMMITTEE**

Rupsa Basu	Doctoral Advisory Committee Chair
Lukai Zhai	Doctoral Advisory Committee Chair
Yvelande Zephyr	Masters Advisory Committee Chair
Majid G.T. Sani	Masters Advisory Committee Member
Waad Aljohani	Masters Advisory Committee Member
Rehab Alhajjar	Doctoral Advisory Committee Member

### **PAST GRADUATE STUDENT ADVISING COMMITTEE**

Tahiyat Alothaim	Masters Advisory Committee Chair
Ashish Saksule	Masters Advisory Committee Member
Alichia Wilson	Masters Advisory Committee Member
Pedro Rodriguez	Masters Advisory Committee Member

### **Awards received by mentees**

Rupsa Basu: Merit Award for poster presentation at the 2<sup>nd</sup> Annual LSTI Research Forum at Michigan Tech, 2016

Rupsa Basu: First Place and People's Choice Awards for "3 minutes thesis" competition at Michigan Tech, Spring 2016

Lukai Zhai: Best oral presentation at the Michigan branch meeting of American Society for Microbiology at Lake Superior State University, Spring 2016

Lukai Zhai: Biological Sciences Outstanding Teaching Award Recipient, Spring 2016.

### **SEMINARS/TALKS**

**Tumban E.** 2017. Vaccines Against Infectious Agents. Michigan Tech Research Forum.

Basu R, Zhai L, Contreras A.S., and **Tumban E.** 2017. *Immunogenicity of in silico-Predicted Zika virus B cell Epitopes Displayed on Phage Virus-like Particles*. 36<sup>th</sup> Annual Conference of the American Society for Virology at the University of Wisconsin, Madison, Wisconsin. Presentation number W50-5.

Zhai. L., Peabody J. Chackerian B. and **Tumban E.** 2017. *A Hybrid HPV L2 Epitope Displayed on Phage Virus-Like Particles is Protective against Six HPV Types.* 36<sup>th</sup> Annual Conference of the American Society for Virology at the University of Wisconsin, Madison, Wisconsin. Presentation number W41-7

*Stability and Immunogenicity of a Spray-dried Bacteriophage L2 Virus-like Particles against Human Papillomavirus Type 16.* First Congress, BioProcess Cuba. February 21<sup>st</sup>, 2017.

*Immunogenicity of a Newly Formulated Bacteriophage L2 Virus-like Particle-based Vaccine against HPV.* 34<sup>th</sup> Conference of the American Society for Virology at London, Ontario, Canada. July 13<sup>th</sup>, 2015.

*Insights on Bacteriophage L2 Virus-Like Particles Candidate HPV Vaccine: Generation and Formulation.* University of Minnesota Medical School, Duluth. April 23<sup>rd</sup>, 2015.

Guest speaker on World AIDS Day Symposium at Michigan Technological University (MTU). Theme: Focus, Partner & Achieve: An AIDS-Free Generation. Event was organized/sponsored by the following MTU groups: African Student Organization (ASO), Women's Leadership Council (WLC), National Society of Black Engineers (NSBE), Medlife, Pre-Health Association. December 1<sup>st</sup>, 2014.

*Immunization with bacteriophage L2 VLPs in the presence or absence of endogenous adjuvants has minor effect on immunogenicity of L2.* Sexually Transmitted Infections Cooperative Research Centers Annual meeting in Taos, New Mexico (2013).

*Immunization with L2 bacteriophage VLPs induces long-lasting and broadly protective antibody responses to multiple HPV types.* 28<sup>th</sup> International Papillomavirus Conference and Clinical Workshop in San Juan, Puerto Rico (2012).

*Bacteriophage VLP-based vaccines targeting the minor capsid protein of human papillomavirus induce long-lasting and broadly protective antibody responses.* 31<sup>st</sup> Annual meeting of the American Society for Virology at the University of Wisconsin in Madison, Wisconsin (2012).

## PRESENTED ABSTRACTS

Basu R., Workman J., and **Tumban E.** 2016. Development of Reagents for Human Papillomavirus Therapeutic Vaccines-related Research. 35<sup>th</sup> Annual Conference of the American Society for Virology at Virginia Tech, Blacksburg, Virginia. Presentation number P8-1.

Zhai L., Stafford D., and **Tumban E.** 2016. Immunization with MS2 Bacteriophage VLPs Displaying Multiple HPV L2 Epitopes Elicits Immune Responses to multiple HPV Epitopes. 35<sup>th</sup> Annual Conference of the American Society for Virology at Virginia Tech, Blacksburg, Virginia. Presentation number P8-16.

Workman J., Basu R., and **Tumban E.** Spring 2016. Development of Reagents for Chikungunya Virus

Vaccine-related Research. Undergraduate Research Expo at Michigan Technological University

Basu R., Workman J., and **Tumban E.** Fall 2015. Insertion of HPV16 E7 T Cell Epitope 10-21 into the Coat Protein of Bacteriophage PP7 does not affect the Assembly of the Coat Protein into Virus-like Particles. MI-ASM meeting at the University of Michigan

Zhai L., Stafford D., and **Tumban E.** Fall 2015. A Bivalent Epitope L2 MS2 Bacteriophage VLP to Enhance Antibody Responses against HPV L2 Capsid Protein. MI-ASM meeting at the University of Michigan

Seitz H., **Tumban E.**, Piszczek G., Pang S., Peabody J., Chackerian B., and Schiller J. 2015. Neutralizing antibody responses to HPV L2 by heterologous prime-boost vaccination with mon- and multimeric antigens. 30<sup>th</sup> International Papillomavirus Conference and Clinical Workshop. Lisbon, Portugal.

Tyler M., **Tumban E.**, Peabody J., and Chackerian B. 2012. Hybrid Virus-like particles displaying multiple L2 epitopes. 28<sup>th</sup> International Papillomavirus Conference and Clinical Workshop, San Juan, Puerto Rico. Presentation Number BP-135

Tyler M., **Tumban E.** and Chackerian B. 2012. Multi-epitope display on virus-like particles. The American Association of Immunologists, Inc, Boston, Massachusetts. Presentation Number 113.26

**Tumban E.**, Peabody J., Peabody D., and Chackerian B. 2011. A Pan-HPV Vaccine Based on Bacteriophage PP7 VLPs Displaying Broadly Cross-Neutralizing Epitopes from the HPV Minor Capsid Protein, L2. 30<sup>th</sup> Annual meeting of the American Society for Virology at the University of Minnesota, Minneapolis. Presentation number P21-1.

**Tumban E.**, Peabody J., Peabody D., and Chackerian B. 2011. A Phage VLP-based Pan-HPV vaccine targeting the minor capsid protein. 27<sup>th</sup> International Papillomavirus Conference and Clinical Workshop, Berlin, Germany. Presentation Number O-27.04

Tyler M., **Tumban E.**, and Chackerian B. 2011. Mapping HPV L2 epitopes with VLP-based vaccines. 27<sup>th</sup> International Papillomavirus Conference and Clinical Workshop, Berlin, Germany. Presentation Number O-27.05

**Tumban E.**, Painta J., and Lott W. 2005. Comparison of Iron Responsive Element (IRE) and the Hepatitis C Virus (HCV) Internal Ribosome Entry Site (IRES)-Domain IV: Structure and Function. American Society of Tropical Medicine and Hygiene, Washington DC. Presentation Number 267

**Tumban E.**, Richin R., and Shaw M. 2003. Gene expression in *Catharanthus roseus* infected with *Vinca virescence* phytoplasma. American Phytopathological Society, Charlotte, North Carolina. Phytopathology 93:S84. Publication Number P-2003-0618-AMA

**Tumban E.**, Rascoe J., and Shaw M. 2002. Phytoplasma typing based on PCR of 16S rRNA and genetic sequences. American Phytopathological Society, Milwaukee, Wisconsin. Phytopathology 92:S82. Publication Number P-2002-0594-AMA

## PROFESSIONAL SERVICES

### Ad hoc reviewer for peer-reviewed journals

mSphere by ASM  
Scientific Reports by Nature  
Antiviral Research  
Nucleic Acids Research  
Current Drug Safety  
Therapeutic Advances in Vaccines  
Journal of Clinical Medicine  
Biomedicine and Pharmacotherapy

### Grant study section

2017 Peer review panel member for the U.S. Army Medical Research and Materiel Command's office of Congressionally Directed Medical Research Programs

## MEMBERSHIP IN PROFESSIONAL ORGANIZATIONS

### Current

American Society for Virology  
American Society for Microbiology  
Michigan American Society for Microbiology (Board member-at-large and Webmaster)

### Past

International Papillomavirus Society

## CONTINUING EDUCATION/TRAINING

October 18<sup>th</sup> 2016: Attended a workshop on how to recognize and deal with autistic students  
June 6-8, 2016: Participant at the National Academies Northstar Summer Institute (NANSI) Workshop (to improve the teaching of Biology) at the University of Minnesota  
January 9<sup>th</sup> 2016. Participant at a Webinar on Targeting Cancer Pathways: Understanding Immune Checkpoints  
November 11<sup>th</sup>, 2015. Participant at the Center for Teaching and Learning Workshop (on Creating a Civil Classroom) at Michigan Tech  
January 8<sup>th</sup>, 2015. Participant at a Research Development Session for Tenure Track Faculty  
2011 and 2013: Participated in workshops on "Writing Grant Proposals" and on "how to write a biosketch"  
2012: Participated in a Teacher and Educational Development workshop on "How people learn"  
2002: Participated in a one-week bioinformatics seminar organized by the National Center for Genome Resources, Santa Fe, New Mexico



### **University and community services**

2017-present: Advisor, Biochemistry Club at Michigan Technological University

2016-present: Webmaster for the Michigan Branch of the American Society for Microbiology Website

Fall 2015, 2016, 2017. Volunteer at Michigan Tech Open House Day

2015-present: Co-advisor, Microbiology Club at Michigan Technological University

January 2016: Participant at the orientation of new graduate students

Spring 2015 & 2016: A judge at the Undergraduate Student Research Expo poster sessions, graduate student poster session, and Life Science and Technology Institute poster sessions at Michigan Technological University

Fall 2014: A judge at the Winter Carnival Queen Competitions at Michigan Technological University

2011: A judge at the University of New Mexico School of Medicine's Medical Students' Research Day

2011-2014: A judge at the Biomedical Science Graduate Program Research Day, University of New Mexico, Albuquerque, NM

2012: A judge at Rio Rancho High School District Science Expo, Rio Rancho, NM

2011: A mentor at "On the Tracks" Education Fair at the University of New Mexico, Albuquerque, NM

2012: An interviewer at the Annual 2012 United States Academic Decathlon® for Middle and high school students, Albuquerque, NM

2012: A judge at Jefferson Middle School Science Fair, Albuquerque, NM