HIEP VU

4240 Fair ST, MOLR 110, Lincoln NE 68583

hiepvu@unl.edu (402)- 472 4528

EDUCATION

2013	Ph.D. in Integrative Biomedical Sciences, UNL
2009	M.S. in Veterinary Sciences, UNL
2005	B.Sc. in Veterinary Medicine, Nong Lam University, Ho Chi Minh City, Vietnam

PROFESSIONAL APPOINTMENT

2022 - present	Associate Professor, Department of Animal Science and Nebraska Center for Virology, UNL
2017 - 2022	Assistant Professor, Department of Animal Science and Nebraska Center for Virology, UNL
2014 - 2017	Research Assistant Professor, Nebraska Center for Virology, UNL

HONORS AND AWARDS

2020	Omtvedt Innovation Award Nomination for Teams
2018	Parents Recognition award for service to students, UNL Parents Association
2017	Junior Faculty for Excellence in Research, awarded by ARD IANR
2015	Breakthrough Innovation of the Year awarded by NUtech Ventures https://www.youtube.com/watch?v=WuVVhuQsG2Y&feature=youtu.be

PROFESSIONAL SERVICES

2020 – Present	Associate Editor, Journal of Medical Virology
2021 – present	Secretary, the NC-229 Multistate Committee
2016 – present:	Scientific Committee Member, North American PRRSV Symposium
2020-2023	Member, The American Society for Virology Membership Review Committee
2021	*Ad hoc* reviewer, Discovery-Skin Disorders Review Panel, Department of Defense Congressionally Directed Medical Research Programs
2021	Guest Editor, Special Issue in Vaccines titled “Swine Vaccines and Vaccinology” for Vaccines
2020	Guest Editor, Special Issue in Vaccines titled “PRRSV Vaccinology and Immunology”
2020	Member - Coronavirus Disease-Immunology Review Panel, Department of Defense Congressionally Directed Medical Research Programs

2019 *Ad hoc* reviewer, Conference proposal for USDA-NIFA

2018 *Ad hoc* reviewer, USDA-NIFA Exploratory Research program

2018 *Ad hoc* reviewer, Minnesota Pork Board

2017 *Ad hoc* reviewer, Industrial Research Fund, Ghent University, Belgium

TEACHING RESPONSIBILITY

Domestic Animal Immunology (ASCI 444/844) – 3 credits

Veterinary virology (VET MED 687) – 3 credits

RESEARCH FUNDING

Active

USDA-NIFA # 2023-67015-39657 **May 2023 – April 2026** **$627,000**
Vu H. (PI), Sillman S. (Co-I).
Molecular determinants of porcine reproductive and respiratory syndrome virus cell tropism.

NU Collaboration Initiative **Jul 2022 – Jun 2024** **$150,000**
Vu H. (PI), Davis P.
A novel self-amplifying mRNA vaccine platform against swine influenza virus.

NE Pork Production Association **Sep 2022 – Aug 2024** **$62,465**
Schmidt A. (PI), Vu H. and Mote B.
PRRS transmission risk associated with exposure to slurry manure or effluent from a PRRS-positive swine herd.

USDA-NIFA 2022-67015-37264 **$770,000**
Vu, H. (PD), McVey S., and Lai, H.
Partnership: Systematic screening of African Swine Fever Virus proteome for identification of immunogenic antigens.

USDA-NIFA Gant No 2020-67015-31414 **Jul 2020 – Jun 2023** **$500,000**
Vu H (PD), Ly H and Gauger P
Development of a broadly protective vaccine against swine influenza virus

NE AES/ Enhanced-Hatch **Oct 2019 – Sep 2024** **$375,000**
Vu H (PD), Dehlon G and Sillman S
A novel platform for rapid and sustainable induction of protective immunity against animal influenza viruses (NC-229).

NE AES/Animal Health **Oct 2019 – Sep 2024** **$125,000**
Vu H (PD), Libault M and Ciobanu D
Identify novel host factors required for porcine reproductive and respiratory syndrome virus infection.
I conceived the idea, wrote the grant, manage the project and associated personnel.

Completed

NE AES/ Animal Health **Oct 2018 – Sep 2023** **250,000**
Ciobanu D (PD), Vu H (co-PD) and Harris S
Identification of novel pathogens and evaluation of host genetics role in viral disease susceptibility

USDA-NIFA Grant No. 2020-67015-31415 **Jul 2020 – Jun 2023** **$500,000**
Ciobanu D and Vu H (co-PD)
Deconstructing the role of SYNGR2 in viral disease susceptibility in livestock

NPB #21-126 **Dec 2021 – Nov 2022** **$72, 508**
Vu H. (PI)
Assessing the feasibility of the mRNA vaccine technology for use against ASF

USDA-NIFA Grant No 2020-68003-32789 **Sep 2020 – Aug 2022** **$1,000,000**
Chapman, B.J., Chaves, B.D., Danyluk, M.D., Schaffner, D.W., Koci, M.D., Montazeri, N., Vu, H., Binder, A, Gunter, C., Jacob, M., Krugg, M., and Melendez, M.
FoodCoVNET: A Collaborative Approach to Managing SARS-Cov-2 Within the Food Industry: Filling Data Gaps and Impacting Behaviors

USDA -FAS-Borlaug **Sep 2020 – Aug 2022** **$60,000**
Calegare L and Vu H (Co-PI)
2020 Borlaug Fellowship - Vietnam: African Swine Fever Vaccine Development

SHIC grant no. 21-117 **Jul 2021 – Jan 2022** **$15,300**
Vu H (PI) and Lai H
Amendment: Time and temperature required for complete inactivation of ASFV.

SHIC Grant No. 20-078 **Jun 2020 – May 2021** **$94,047**
Vu H (PI) and Lai H
Evaluate the diagnostic performance of pen-side tests for ASF detection.

USDA NIFA Grant No. 2018-67015-28294 **Jun 2018 – May 2021** **$489,935**
Vu H (PD) and Osorio F
Development of a broadly protective DIVA marker vaccine against porcine reproductive and respiratory syndrome virus.

Acceligen **Jul 2020 – Jun 2021** **$33,510**
Vu H (PI)
Evaluate the Susceptibility of Genetically Modified Pigs to PRRSV Infection

SHIC Grant No. 20-071 **Apr 2020 – Jan 2021** **$31,225**
Vu H (PI) and Lai H

Time and temperature required for complete inactivation of African swine fever virus.

Matmacorp **Nov 2019 – Oct 2020** **$4,510**
Vu H (PI)
Experimental Infection of Boars with PRRSV

Matmacorp **Dec 2018 – May 2019** **$5,465**
Vu H (PI)
Experimental Inoculation of Pigs with PRRSV.

Phibro Animal Health **Mar 2018 – Mar 2019** **$58,654**
Vu H (PI) and Osorio F
Evaluation of the Protective Efficacy of pMJPRRS Vaccine in Pigs

National Pork Board Grant No. 17-151 **Oct 2017 – Sep 2018** **$97,300**
Vu H (PI) and Osorio F
Targeted development of neutralizing monoclonal antibodies against PRRSV minor glycoprotein

USDA NIFA Grant No. 2017-67015-26634 **Jul 2017 – Jun 2021** **$459,200**
Ciobanu D, Vu H (co-PD), Kachman S
Investigation of host genetic role in porcine circovirus type 2 (PCV2) and porcine reproductive and respiratory syndrome virus (PRRSV) susceptibility.

USDA NIFA Grant No. 2016-67015-24922 **Feb 2016 – Feb 2019** **$477,635**
Vu H (PD), Osorio F and Ma F
Correlates of cross-protective immunity to PRRSV

NE AES/ Animal Health **Oct 2016 – Sep 2019** **$57,000**
Vu H. (PD) and Osorio F
Development of broadly protective vaccines against PRRSV

National Pork Board Grant No. 16-060 **May 2016 – May 2018** **$89,125**
Vu H (PI) and Weaver E, Osorio F, and Ma F
Broadly protective nasal mucosal vaccine for influenza A virus of swine

Auburn University **May 2016 – Apr 2017** **$15,588**
Vu H (PI) and Osorio F
Evaluation of Protective Efficacy of Peptide-Based Vaccines against PRRSV

National Pork Board Grant No. 15-159 **Oct 2015 – Mar 2017** **$96,880**
Vu H (PI) and Osorio F
Development of a live-attenuated PRRSV vaccine capable of eliciting a broad spectrum of heterologous protection.

National Pork Board Grant No. 14-200 **Oct 2014 – Sep 2015** **$100,000**

Vu H (PI) and Osorio F
Determine the mechanisms of cross-protection against infection with a divergent porcine reproductive and respiratory virus strain.

National Pork Board Grant No. 14-214 Oct 2014 – Sep 2016 $83,094
Diel D (PI), Vu H, Nelson E and Henning J
Evaluation of immunodominant B- and T-cell epitopes as inducers of protective immunity against PRRSV.

National Pork Board Grant No. 13-155 Oct 2013 – Sep 2014 $75,000
Vu H (PI) and Osorio F
Rational design of a broadly protective vaccine against PRRSV

INVENTIONS

1. **A non-naturally occurring porcine reproductive and respiratory syndrome virus and methods of using**
   Vu HL., Osorio FA., Laegreid W., Pattnaik AK., and Ma F.
   Patent no 10,072,046, issued on September 11th, 2018
   Patent no 10,738,088, issued on August 11st, 2020
   Patent application #16/886,378, filed on May 28th, 2020
2. **Synaptogyrin-2 influence replication of porcine circovirus 2**
   Ciobanu D., **Vu HL.**, Engle T., and Walker L.
   Patent application # US 16/149,059, filed on October 1st, 2018.

LICENSED TECHNOLOGIES

1. **A method for the development of a porcine reproductive and respiratory virus vaccine strain capable of inducing broad protection**
   Vu HL., Osorio FA., Laegreid W., Pattnaik AK., and Ma F.
   NUtech technology ref #2173

2. **A virulent isolate porcine reproductive and respiratory syndrome virus (PRRSV) and methods of using.**
   Vu HL.
   NUtech technology ref #2020-050

BOOK CHAPTER

1. Kennedy M, Delhon G, McVey DS, **Vu H**, and Borca M. 2021. Chapter 49: Asfarviridae and Iridoviridae. In *Veterinary Microbiology*, 4th Edition.; McVey, S., Kennedy, M., M.M. Chengappa, M.M., Wilkes, R., Eds. Wiley Blackwell: 2022.

   I wrote the section "Host responses to infection" and edited the chapter.

PEER-REVIEWED PUBLICATIONS (2017 – Current)

1. Chaudhari J, Leme RA, Durazo-Martinez K, Sillman S, Workman AM, **Vu H.L.*** 2022. A single amino acid substitution in porcine reproductive and respiratory syndrome virus glycoprotein 2 significantly impairs its infectivity in macrophages. *Viruses 2022 Dec 18;14(12):2822*. PMID: 36560826.
2. Kumari S., Chaudhari J., Huang Q., Gauger P., Almeida M., Liang Y., Ly H., **Vu H.L.*,** Immunogenicity and protective efficacy of a recombinant Pichinde viral vectored vaccine expressing influenza virus hemagglutinin antigen. *Vaccines (Basel). 2022 Aug 26;10(9):1400.* PMID: 36146478.
3. Hille, M.M., Spangler, M.L., Clawson, M.L., Heath, K.D., **Vu, H.L.,** Rogers, R.E.S., Loy, J.D., A Five Year Randomized Controlled Trial to Assess the Efficacy and Antibody Responses to a Commercial and Autogenous Vaccine for the Prevention of Infectious Bovine Keratoconjunctivitis. *Vaccines (Basel). 2022 Jun 9;10(6):916.* PMID: 35746524.
4. Chaudhari, J., Nguyen, T.N., **Vu, H.L.*,** Identification of Cryptic Promoter Activity in cDNA Sequences Corresponding to PRRSV 5' Untranslated Region and Transcription Regulatory Sequences. *Viruses. 2022 Feb 15;14(2):400.* PMID: 35215993.
5. Luong Q.H., Lai T.L.H., Do L.D., Ha X.B., Nguyen V.G. and **Vu H.L., 2022.** Differential antibody responses in sows and finishing pigs naturally infected with African swine fever virus under field conditions. *Virus Res. 2022 Jan 2;307:198621.* PMID: 34799123.
6. Dhakal J, Vu H.L, Chaudhari J, Nguyen K, Chaves B D . 2022. Method Validation for the Recovery of the Porcine Respiratory and Reproductive Syndrome Virus a Potential SARS-CoV-2 Surrogate, from Stainless Steel. *Letters in Applied Microbiology*, ovac068, https://doi.org/10.1093/lambio/ovac068.
7. Chaudhari J., Liew CS, Riethoven JJ, Sillman S., and **Vu H.*, 2021.** Porcine reproductive and respiratory syndrome virus infection upregulates negative immune regulators and T cell exhaustion markers. J Virol. 2021 Oct 13;95(21):e0105221. PMID: 34379512.
8. Truong, Q.L., Nguyen, T.L., Nguyen, T.H., Shi, J., **Vu, H.L.,** Lai, T.L.H., Nguyen, V.G., **2021.** Genome Sequence of a Virulent African Swine Fever Virus Isolated in 2020 from a Domestic Pig in Northern Vietnam. *Microbiol Resour Announc 10:e00193-21.* PMID: 33986078
9. Chaudhari J., and **Vu H***. Porcine Reproductive and Respiratory Syndrome Virus Reverse Genetics and the Major Applications. Viruses. **2020** Oct 31;12(11). Review. PMID: 33142752
10. Luong, H.Q., Lai, T.L.H., and **Vu, H*., 2020.** Evaluation of Antibody Response Directed against Porcine Reproductive and Respiratory Syndrome Virus Structural Proteins. Vaccines 2020, 8, 533. PMID: 32947931
11. Chaudhari J., Liew CS, Workman A, Riethoven JJ, Steffen D., Sillman S and **Vu H.*, 2020**. Host Transcriptional Response to Persistent Infection with a Live-Attenuated Porcine Reproductive and Respiratory Syndrome Virus Strain. ***Viruses*** 2020, 12(8), 817. PMID: 32731586
12. Sun, H., Sur, J.H., Sillman, S., Steffen, D., **Vu, H.*, 2019**. Design and characterization of a consensus hemagglutinin vaccine immunogen against H3 influenza A viruses of swine. *Vet Microbiol 239, 108451.* PMID: 31767095
13. Walker LR, Engle TB, **Vu H**, Tosky ER, Nonneman DJ, Smith TPL, Borza T, Burkey TE, Plastow GS, Kachman SD, and Ciobanu DC*. 2018. Synaptogyrin-2 influences replication of Porcine circovirus 2. *PLoS Genet. Oct 31;14(10):e1007750*. PMID: 30379811

14. Sun H, Workman A, Osorio FA., Steffen D, and **Vu H***. **2018.** Development of a broadly protective modified-live virus vaccine candidate against porcine reproductive and respiratory syndrome virus. ***Vaccine 36(1):66-73.*** *PMID: 29174314*

15. Pattnaik, A., Palermo, N., Sahoo, B. R., Yuan, Z., Hu, D., Annamalai, A. S., **Vu, H.,** Correas, I., Prathipati, P. K., Destache, C. J., Li, Q., Osorio, F., Pattnaik, A., Xiang, S.-H. **2018.** Discovery of a non-nucleoside RNA polymerase inhibitor for blocking Zika virus replication through in silico screening. *Antiviral research*. PMID: 29274845

16. Annamalai, A. S., Pattnaik, A., Sahoo, B. R., Muthukrishnan, E., Natarajan, S., Steffen, D. J., **Vu, H.,** Delhon, G., Osorio, F., Petro, T. M., Xiang, S.-H., Pattnaik, A. **2017**. Zika Virus Encoding Non-Glycosylated Envelope Protein is Attenuated and Defective in Neuroinvasion. ***J. Virology*** vol. 91 no. 23 e01348-17. PMID: 28931684

17. Kimpston-Burkgren K, Correas I, Steffen D, Pattnaik AK, Fang Y Osorio FA and **Vu HL***. **2017.** Relative contribution of porcine reproductive and respiratory syndrome virus open reading frames 2–4 to the induction of protective immunity. ***Vaccine 35: 4408–4413.*** PMID: 28689650

18. Correas I, Pattnaik AK, Osorio, FA, and **Vu HL*. 2017.** Cross-reactivity of immune responses to porcine reproductive and respiratory syndrome virus infection. ***Vaccine 35: 782–788***. PMID: 28062126

19. Vu HL*, Pattnaik AK, and Osorio FA. **2017.** Strategies to broaden the cross-protective efficacy of vaccines against porcine reproductive and respiratory syndrome virus. ***Veterinary Microbiology 206: 29–34.*** PMID: 27692670

20. Sun H**,** Pattnaik AK, Osorio FA and **Vu HL***. **2016.** Identification of viral genes associated with the interferon-inducing phenotype of a synthetic porcine reproductive and respiratory syndrome virus strain. ***Virology 499: 313–321.*** PMID: 27736706

21. Workman AM*, Smith TP, Osorio FA, **Vu HL***. **2016.** Complete genome sequence of highly virulent porcine reproductive and respiratory syndrome virus variants that recently emerged in the United States. ***Genome Announcement 4(4):e00772-16.*** PMID: 27491998

22. **Vu HL*,** Ma F, Laegreid WW, Pattnaik AK, Steffen D, Doster AR, and Osorio FA*. **2015.** A synthetic porcine reproductive and respiratory syndrome virus strain confers unprecedented levels of heterologous protection. ***J Virol. 89(23):12070-83.*** PMID: 26401031

23. Massilamany C, Gangaplara A, Basavalingappa RH, Rajasekaran RA, **Vu HL,** Riethoven JJ, Steffen D, Pattnaik AK, and Reddy J***. 2015.** Mutations in the 5' NTR and the non-structural protein 3A of the coxsackievirus B3 selectively attenuate myocarditogenicity. ***PLoS One. 10(6):e0131052.*** PMID: 26098885

24. **Vu HL,** Kwon B, de Lima M, Pattnaik AK, and Osorio FA*. **2013.** Characterization of a serologic marker candidate for development of a live-attenuated DIVA vaccine against porcine reproductive and respiratory syndrome virus. ***Vaccine 31: 330–4337.*** PMID: 23892102

25. Beura LK, Subramaniam S, **Vu HL,** Kwon B, Pattnaik AK, and Osorio FA*. **2012.** Identification of amino acid residues important for anti-IFN activity of porcine reproductive and respiratory syndrome virus non-structural protein 1. ***Virology 433: 431–439.*** PMID: 22995188

26. **Vu HL,** Kwon B, Yoon KJ, Laegreid WW, Pattnaik AK, and Osorio FA*. **2011.** Immune evasion of porcine reproductive and respiratory syndrome virus through glycan shielding involves both glycoprotein 5 as well as glycoprotein 3. ***J Virol. 85(11):5555-64***. PMID: 21411530 ***(Selected for Spotlight section of the issue).***

27. Das PB, **Vu HL,** Dinh PX, Cooney JL, Kwon B, Osorio FA, and Pattnaik AK*. **2011.** Glycosylation of minor envelope glycoproteins of porcine reproductive and respiratory syndrome virus in infectious virus recovery, receptor interaction, and immune response. ***Virology 410: 385–394***. PMID: 21195444

INVITED PRESENTATIONS

1. **Vu HL.,** New insights into PRRSV tropism. *The Michael Murtaugh Lecturer. University of Minnesota, June 14, 2023*
2. **Vu HL.**, Biotechnology for the next generation of veterinary antiviral vaccines, *In Vitro Biology Meeting, San Diego, CA, June 4-7, 2022.*
3. **Vu HL.,** Synthetic Biology and the Future of Swine Vaccines. *PorciForum, Lleida, Spain, March 23-24, 2022.*
4. **Vu HL.** The journey to a new generation of vaccines against porcine reproductive and respiratory syndrome virus. *Vietnam National Conference on Animal & Veterinary Sciences. Ho chi Minh City, Vietnam. September 2019.*
5. **Vu, HL.,** Overview of gene technologies for developing viral vaccines for swine. *Swine viral vaccines Workshop. Nong Lam University, Ho Chi Minh City, Vietnam June 7-8, 2018.*
6. **Vu, HL.,** Challenges and genetic engineering in developing vaccines against positive-strand RNA viruses. Swine viral vaccines *Workshop. Nong Lam University, Ho Chi Minh City, Vietnam June 7-8, 2018.*
7. **Vu, HL.,** Challenges and genetic engineering in developing a vaccine against negative-strand RNA viruses. *Swine viral vaccines Workshop. Nong Lam University, Ho Chi Minh City, Vietnam June 7-8, 2018.*
8. **Vu, HL.,** Rational design of a broadly protective vaccine against porcine reproductive and respiratory syndrome virus. *University of Minnesota College of Veterinary Medicine seminar series. November 2016.*
9. **Vu HL.,** Control and eradication of PRRSV: How next-generation sequencing can help. *US Meat Animal Research Center, Clay Center, NE. August 2015.*
10. **Vu HL.,** Strategies to develop a new PRRSV vaccine with broader cross-protection. *Vaccines Against Antigenically Variable Viruses Symposium. Ames IA. June 2014.*