Curriculum Vitae

Your Name: Chioma M. Okeoma
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Year	Degree	Location
1996	B Agric Tech	Federal University of Technology Owerri, Nigeria

Year	Degree	Location
1998	N/A	National Youth Service Corps, Kogi State Polytechnic, Nigeria

Years	Degree	Location
2000	MSc	Federal University of Agriculture Umudike, Nigeria

Years	Degree	Location
2006	PhD	Massey University, Palmerston North, New Zealand

Years	Specialty	Location
2005	Researcher*	State University of New York at Buffalo

Years	Specialty	Location
2006	Researcher*	University of Pennsylvania

** Positions assumed after completing graduate research in 04 prior to thesis defense in 05, and award of degree in 06. The delay in my thesis defense at Massey University was due to how the system was organized whereby local and external examiners (usually from overseas) would be involved. Finding agreeable time took time.*

CURRENT POSITION
Associate Professor, Vice Chair for Research New York Medical College (NYMC), Valhalla, NY 10595
Fellow, Lovelace Biomedical Research Institute, Albuquerque, NM 87108-5127

OTHER EMPLOYMENT	Position, Description, Employer Information, Location
08/01/17-01/31/22	Associate Professor, Stony Brook University
04/22/17-07/31/17	Associate Professor, The University of Iowa, Iowa City, IA
08/01/10 - 04/21/17	Assistant Professor, The University of Iowa, Iowa City, IA

HONORS & AWARDS

Year	Honors & Awards
2000	Doctoral scholarship, New Zealand Overseas Development Assistance, Massey University, Palmerston North, New Zealand
2005	Most commendable published paper prize for: Isolation and molecular characterization of *Neospora caninum* in cattle in New Zealand. New Zealand Veterinary Journal 52, 364-370. PMID: 15768137 Australian College of Veterinary Scientists, Australia
2006	Postdoctoral trainee (5-T32-CA-009140-29 to UPENN)
2008	Andy Kaplan Prize: Cold Spring Harbor Retrovirus Meeting
2015	American Society for Virology (ASV) Invited Keynote speaker
2015	University of Iowa Nominee for Iowa Women of Innovation Awards, Technology Association of Iowa
2015	Finalist for Iowa Women of Innovation Awards by Technology Association of Iowa
2015	National Science Foundation (NSF) Innovation Corps Program Award
2016	University of Iowa Nominee for Iowa Women of Innovation Awards, Technology Association of Iowa Recipient of the Iowa Women of Innovation Awards by Technology Association of Iowa
2017	University of Iowa 2016 inventor Award
2017	University of Iowa Startup Launched Award

SERVICE

EXTRAMURAL SERVICE

Organizations & Societies

PROFESSIONAL AND SCIENTIFIC SOCIETY MEMBERSHIP

Year	Association
2011	American Society for Microbiology (ASM)
2011	American Society for Virology (ASV)
2011	American Association of Immunologists (AAI)
2017	American Society for Exosomes and Microvesicles (ASEMV)
2019	American Society for biochemistry and microbiology (ASBMB)
2020	American Society for Reproductive Immunology (ASRI)

SELECT EDITORIAL WORK:
Scientific Reports Editor
Viruses Special Issue Editor: Viruses and Extracellular Vesicles
https://www.mdpi.com/journal/viruses/special_issues/Viruses_EVs

SELECT MANUSCRIPT REVIEW ACTIVITIES

- Journal of Virology
- Journal of extracellular vesicles
- FEBS Letters
- Scientific Reports
- Cell Death and Diseases
- European Journal of Immunology
- Clinical & Experimental Metastasis
- Disease Models & Mechanisms
- Future Virology
- PLos One
- PLos Pathogens
- PLos Neglected Tropical Diseases
- Virology- Elsevier
- Virology- BMC
- Recent Patents on Biomarkers
- BMC Veterinary Research
- BMC Biology
- Bentham Science Publishers
- Medicines
- Human Reproduction
- International Journal of Virology and AIDS
- Point Journal of Medicine and Medical Research (PJMMR)
- Emerging Microbes & Infections
- Journal of Agriculture and Biodiversity Research (JABR)
- African Journal of Microbiology Research

GRANT REVIEW

NATIONAL

- Standing member, HIV Molecular Virology, Cell Biology and Drug Development (HVCD) NIH study section
- NIDA, Special Emphasis panel
- Division of AIDS, Behavioral, and Population Sciences (DABPS), AIDS & AIDS Related Research (AARR)
- HIV Comorbidities and Clinical Studies Study Section (HCCS),
- ZRG1 MDCN-G (58) R - PAR: Exosomes and SUDs (Teleconference)
- ZDA1 HXO-H (02) R Assessing the Effects of Cannabinoids on HIV-Induced Inflammation (Teleconference)
- Molecular Neuropharmacology and Signaling Study Section (MNPS)

INTERNATIONAL

- Icelandic Research Fund (IRF)
- The Canadian Institutes of Health Research (CIHR), the Natural Sciences and Engineering Research Council of Canada (NSERC) and the Social Sciences and Humanities Research Council (SSHRC)
- Terry Fox Foundation
- The Al Jalila Foundation

FORMAL TEACHING

Undergraduate

From	To						
		Activity	Introduction to Animal Viruses: Undergraduate				
2012	2016	**Your Role**	Lecturer				
		# Learners	9-15	**#hours/session**	2	**#sessions/AY**	14
		Effectiveness					
From	**To**	**Activity**	Pharmacy Microbiology				
2016	2017	**Your Role**	Course director & Lecturer				
		# Learners	79	**#hours/session**	1	**#sessions/AY**	14
		Effectiveness					
From	**To**	**Activity**	Undergraduate Pharmacology Colloquium Course				
2018	2018	**Your Role**	Facilitator				
		# Learners	15	**#hours/session**	1 hour 30 minutes	**#sessions/AY**	1
		Effectiveness					
From	**To**	**Activity**	UGC First-Year Seminar 102 SSO 102-S05 (52177)				
2020	2020	**Your Role**	Course director & Lecturer				
		# Learners	24	**#hours/session**	1 hour 20 min	**#sessions/AY**	14
		Effectiveness					
From	**To**	**Activity**	UGC First-Year Seminar 102 SSO 102-S06 (52178)				
2020	2020	**Your Role**	Course director & Lecturer				
		# Learners	23	**#hours/session**	1 hour 20 min	**#sessions/AY**	14
		Effectiveness					

Graduate

From	To						
		Activity	Introduction to Animal Viruses: Graduate				
2011	2016	**Your Role**	Lecturer				
		# Learners	9-15	**#hours/session**	2	**#sessions/AY**	14
		Effectiveness					
From	**To**	**Activity**	Introduction to Animal Viruses: Graduate Discussion				
2011	2016	**Your Role**	Course director & Lecturer				
		# Learners	6 - 9	**#hours/session**	1	**#sessions/AY**	14
		Effectiveness					
From	**To**	**Activity**	Medicine and Society I - Case Based Learning				
2013	2015	**Your Role**	Facilitator				
		# Learners	8	**#hours/session**	2	**#sessions/AY**	10
		Effectiveness					
From	**To**	**Activity**	Biology and Pathogenesis of Viruses				
2013	2015	**Your Role**	Course director & Leader				
		# Learners	6 - 9	**#hours/session**	1 hour 30	**#sessions/AY**	14

					minutes		
		Effectiveness					
From	**To**	**Activity**	Pathogens & Host Defense (small group interactive session)				
2018	2018	**Your Role**	Lecturer				
		# Learners	15	**#hours/session**	1 hour 30 minutes	**#sessions/AY**	1
		Effectiveness					
From	**To**	**Activity**	Responsible Conduct in Research GRD500 course (Authorship, facilitator)				
2018	2021	**Your Role**	Lecturer				
		# Learners	6 - 9	**#hours/session**	2	**#sessions/AY**	1
		Effectiveness					
From	**To**	**Activity**	HBH 580: Selected Topics in Pharmacology				
2018	2021	**Your Role**	Co-Director				
		# Learners	6 - 12	**#hours/session**	1 hour 30 minutes	**#sessions/AY**	12 - 15
		Effectiveness					
From	**To**	**Activity**					
2019	2021	**Your Role**	MCB/HBH 656: Cell & Tissue Biology (Signaling via Extracellular Vesicles)				
		# Learners	45 - 50	**#hours/session**	1 hour 30 minutes	**#sessions/AY**	1
		Effectiveness					
From	**To**	**Activity**	HBH 545: Biochemical Lab Techniques				
2019	2021	**Your Role**	Co-Director and Lecturer				
		# Learners	6 - 12	**#hours/session**	1 hour 30 minutes	**#sessions/AY**	6
		Effectiveness					
From	**To**	**Activity**	Advanced Pharmacology – BCP 402, HBH 502 & HBH 632_Antiviral drugs				
2020	2021	**Your Role**	Lecturer				
		# Learners	26	**#hours/session**	3	**#sessions/AY**	1
		Effectiveness					
From	**To**	**Activity**	HBH632 Graduate Pharmacology Discussion Session				
2020	2021	**Your Role**	Facilitator				
		# Learners	9	**#hours/session**	1 hour 30 minutes	**#sessions/AY**	1
		Effectiveness					
From	**To**	**Activity**	Basic Principles of Pharmacology, 11 students/year				
2021	2021	**Your Role**	Lecturer				
		# Learners	11	**#hours/session**	2	**#sessions/AY**	12
		Effectiveness					

FORMAL MENTORING

POSTDOCTORAL MENTEES: PAST & PRESENT					
From	To	Trainee	Topic of Research Project	Institution	Current Position
2010	2015	Philip H. Jones	The role of restriction factors in viral pathogenesis	University of Iowa	Lead Researcher UPMC Children's Hospital of Pittsburgh, Department of Pediatrics Neonatal Medicine, 4401 Penn Ave Pittsburgh, PA 15224 Email: phj3@pitt.edu
2011	2013	Harshini V Mehta	The role of restriction factors in viral pathogenesis	University of Iowa	Unknown
2012	2015	Marisa N. Madison	The role of extracellular vesicles in HIV infection and transmission	University of Iowa	Assistant Professor; Department of Mathematics and Natural Sciences Miami Dade College Homestead Campus. Email: MMadison@mdc.edu
2016	2017	Wadie D. Mahauad-Fernandez	BST-2 in breast cancer development and progression	University of Iowa	Postdoctoral Fellow-Felsher Lab Division of Oncology Stanford University Phone: 319-471-7682 Email: wmahauad@stanford.edu
2018	2021	Yuan Lyu	The role of BST-2 in breast cancer progression	Stony Brook University	At home Mom in China Email: lvyuan10@outlook.com
2019	2021	Adonis McQueen	Mechanisms of semen exosomes mediated inhibition of HIV reverse transcriptase	Stony Brook University	Postdoctoral Fellow-Okeoma Lab, Department of Pharmacology, Stony Brook University Email: adonis.mcqueen@stonybrook.edu
2017	2021	Hussein Kaddour	The role of extracellular vesicles in viral pathogenesis	University of Iowa/Stony Brook University	Scientist, Regeneron Pharmaceuticals, Inc., Tarrytown, NY 10591, USA Email: hussein.kaddour@regeneron.com

PRE-DOCTORAL MENTEES				
From	To	Trainee	Institution	Current Position
2012	2016	Wadie Mahauad-Fernandez	University of Iowa	PostDoc, Stanford University
2015	2019	Jennifer Welch	University of Iowa	PostDoc, University of Iowa
2016	2017	Wasifa Naushad	University of Iowa	Visiting PhD Scholar/ Research Specialist
2017	2020	Tyler Panzner	Stony Brook University	Clinical Analyst II, Sema4 Genomics
2018	-	Folnetti Alverz	Stony Brook University	Graduate student
2018	-	Steven Kopcho	Stony Brook University	Graduate student
2018	2021	Nadia Shouman	Stony Brook University	Volunteer
2019	2021	Long Cao	Stony Brook University	Graduate student
2020	2021	Elijah Haar	Stony Brook University	Graduate student

UNDERGRADUATE MENTEES			
From	To	Trainee	Institution
2010	2011	Ebose Okoruwa	University of Iowa
2011	2015	Alexander Canfield	University of Iowa
2013	2016	Ariel L. Kleinschmidt	University of Iowa
2016	2017	Vishal Perera	University of Iowa
2017	2018	Aissa Kergna	University of Iowa
2017	2019	Steven Kopcho	Stony Brook University
2018	2019	Clinton Tang	Stony Brook University
2019	2020	Nusrat Jahan	Stony Brook University
2019	2021	Jacob Abulencia	Stony Brook University
2019	2021	Malik Tranquille	Stony Brook University

COMPREHENSIVE EXAM AND THESIS COMMITTEE MEMBERSHIP (‡INDICATES CHAIR OF THE COMMITTEE)			
From	To	Mentee	Activity
2011	2011	Sven Moller-Tank	Comprehensive exam
2011	2013	Nirjal Bhattarai	Thesis committee member
2012	2015	Bethany Rhein	Comprehensive exam‡ and Thesis committee member
2011	2015	Kyle Nilson	Comprehensive exam and Thesis committee member
2012	2015	Ernest Chivero	Comprehensive exam and Thesis committee member
2013	2013	Jeremiah Athmer	Comprehensive exam

2013	2016	Rachel Brouillette	Comprehensive exam± and Thesis committee member
2015	2015	Matthew Grunewald	Comprehensive exam
2012	2016	Wadie Daniel Mahauad-Fernandez	Thesis committee member±
2015	2018	Jennifer Welch	Thesis committee member±
2016	2017	Jessica Gregson	Thesis committee member
2018	2019	Noele Certain	Molecular and Cellular Pharmacology qualifying exam±
2018	2019	Margaret Shevik	Molecular and Cellular Pharmacology qualifying exam±

RESEARCH ACTIVITY

ACTIVE GRANTS				
From	**To**	**Title (Award #)**	**Your Role**	**Total Direct Costs**
06/01/2016	07/30/2021 (NCE)	The effect of HIV and cocaine abuse on semen exosome composition and function (**R01 DA042348**)	PI	$6,271.79
			Percent Effort	**Source of Funding**
		PI Okeoma	1	NIDA
From	**To**	**Title (Award #)**	**Your Role**	**Total Direct Costs**
09/30/2019	07/31/2024	Cannabinoid modulation of EV composition and function in HIV/SIV infection (**R01 DA050169**)	PI	$621,165
			Percent Effort	**Source of Funding**
		PI Okeoma	33.33	NIDA
From	**To**	**Title (Award #)**	**Your Role**	**Total Direct Costs**
04/15/2021	03/31/2023	Characterizing the physicochemical properties of membraneless condensates and its regulation by delta-9-tetrahydrocannabinol in HIV/SIV infection (**R21 DA053643**)	PI	$142,420
			Percent Effort	**Source of Funding**
		PI Okeoma	8.33	NIDA
PENDING GRANTS				
From	**To**	**Title (Award #)**	**Your Role**	**Total Direct Costs**
07/01/2022	06/30/2027	2D Particle Purification Liquid Chromatography (PPLC) for efficient Extracellular Vesicles Purification (**R24 AI172443**)	PI	
			Percent Effort	**Source of Funding**
		PI Okeoma	30	NIAID
From	**To**	**Title (Award #)**	**Your Role**	**Total Direct Costs**
07/01/2022	06/30/2027	Extracellular vesicles regulate HIV transcription (**R01 DA000000-00**)	PI	
			Percent Effort	**Source of Funding**
		PI Okeoma	30	NIDA
From	**To**	**Title (Award #)**	**Your Role**	**Total Direct Costs**
07/01/2022	06/30/2027	Extracellular miR-128 in HIV infection and drug abuse (**R01 000000-00**)	PI	
			Percent Effort	**Source of Funding**
		PI Okeoma	20	NIDA

RESEARCH INNOVATION

Research interest

My laboratory investigates how host factors expressed in host cells or present in extracellular milieu, such as extracellular vesicles and extracellular condensates regulate response against infective agents and disease pathogenesis. Our translational experiments use primary cells, animal models, and human clinical specimens to study spatiotemporal regulation of host factors and their effects on clinical outcomes. We use integrative scientific approaches including multi-modal datasets, computational modeling, Omics technologies, as well as cellular and molecular biology experimental tools in our studies. Discoveries made through this area of research will expand our knowledge and may lay the foundation for development of new tools and strategies for treatment and prevention of diseases. My laboratory provides an environment that encourages, nurtures, and values diversity, inclusivity, and innovation. My laboratory is funded by multiple active grants. We also have multiple pending grants. Please see below:

Current grant support

R01 DA042348 (NCE)
The effect of HIV and cocaine abuse on semen exosome composition and function:
In this application, studies are designed to 1) determine the effect of HIV infection and cocaine abuse on the anti-HIV activity of semen exosomes, 2) determine the mechanisms of anti-HIV effect of semen exosomes, and 3) characterize the effects of donor HIV status and cocaine use on semen exosome composition. As sexual transmission is the main route for the spread of HIV and semen is the primary vector, the studies proposed in this application will address a new challenge for evaluation of the efficacy of semen exosomes as a protective factor against HIV and how donor HIV status and cocaine use modulate this function.
Role: PI

R01 DA050169
Cannabinoid modulation of EV composition and function in HIV/SIV infection:
We will evaluate how cannabinoid (delta-9-tetrahydrocannabinol, THC) modulates the composition and function of EVs during HIV/SIV infection, focusing on the gastrointestinal tract (GI) and peripheral lymph nodes using the SIV-rhesus macaque model. The benefits of THC is systemic—affecting many organs, including the GI and lymphoid systems. Gap in knowledge - The underlying mechanisms of THC-mediated reduction in systemic inflammation, immune activation, and lymph node fibrosis in HIV/SIV infection is unclear. Thus, we will 1) Iso-late and characterize the effects of combined cART and THC on EV secretion and composition using the SIV/RM model, 2) Determine the effect of THC/SIV EVs on T cell/monocyte activation and intestinal epithelial barrier disruption in vitro, and 3) Determine the effect of THC/SIV EVs isolated from blood and lymph nodes on collagen production by lymph node follicular reticular cells (FRC).
Role: MPI

R21/R33 DA053643
Characterizing the physicochemical properties of membraneless condensates and its regulation by delta-9-tetrahydrocannabinol in HIV/SIV infection:
In this proposal, we will use our novel isolation tool—PPLC to isolate BMCs from rhesus macaque blood, CSF, saliva, and intestinal contents. We will then use various structural, biochemical, and cell biology assays to pro-vide structural, molecular, and functional classification of BMCs from SIV infected and THC treated macaques, which will provide a framework to dissect BMC functions in HIV/AIDS and THC use.
Role: MPI

Below is a summary of the contributions my laboratory has made to science.

Development of Particle Purification Liquid Chromatography (PPLC) and discovery of extracellular vesicles and membraneless condensates as exRNA carriers: Acellular particles (extracellular vesicles, EVs; and membraneless condensates, MCs) are ex-RNA carriers that have important research, drug discovery, and therapeutic implications. However, lack of accurate and efficient isolation and retrieval have impeded their use. Through years of studying EV biology, composition, and function, my laboratory has developed a novel size-guided Particle Purification Liquid Chromatography (PPLC) that is integrated into a turbidimetry-enabled system for dye-free isolation, on-line characterization, and retrieval of intact acellular particles from biofluids (**US patent application PCT US2020/030914**). Purified particles can be collected using an attached fraction collector. On-line UV–Vis monitoring is used to analyze particle spectra, as a means of revealing inter sample differences, including the presence or absence of ex-RNA. Turbidimetry provides accurate physical characterization of sample's lipid content, size, and concentration. PPLC is a comprehensive, yet affordable platform for isolating, collecting, and analyzing acellular particles to facilitate extracellular particle research and application in drug delivery and therapeutics. We used PPLC to identify i) archetypal SEV subsets (SEV_L, SEV_S) carrying various exRNA biotypes, and ii) non-archetypal-membraneless condensates (MCs) also carrying exRNAs. These findings confirm the differential enrichment of exRNA in EVs and MCs from body fluids.

a. Kaddour H, Lyu Y, Shouman N, Mohan M, and **Okeoma CM**. Development of Novel High-resolution Size-guided Turbidimetry-enabled Particle Purification Liquid Chromatography (PPLC): Extracellular Vesicles and Membraneless Condensates in focus. IJMS. 2020.

Discovery that EVs serve as conduits by which viral- and/or psychostimulant- induced epigenetic mechanisms lead to biological changes that influence host response to infection: HIV+ individuals are often comorbid with drug abuse. Exposure to psychostimulants may be best viewed as a general vulnerability factor for susceptibility to HIV by the exposed persons; and/or for immune and developmental disorders for their offspring, in cases of parental exposure. Although anti-retroviral therapy (ART) has dramatically reduced HIV/AIDS related mortality, psychostimulant use is a major barrier for combating the HIV pandemic partly because they i) impair decision-making processes that increase risky behavior, ii) alter cellular physiology that promote viral transmission, and iii) weaken host immunity against HIV. The epidemiological link between psychostimulant use, rapid HIV disease progression, and AIDS-related mortality even among adherent ART users receives strong support from experimental studies in cultured cells and non-human primates. For example, cocaine is one of the most commonly abused psychostimulants among HIV+ individuals, where users have been shown to have lower CD4+ T cell counts and accelerated CD4+ T cell decline that may contribute to enhanced disease progression. Similar to cocaine, cannabis (marijuana) is another commonly used psychostimulant in the setting of HIV comorbidity, and HIV/AIDS patients use cannabis to treat disease symptoms and side effects of ART. In contrast to cocaine, studies have shown that administration of THC, a component of cannabis, is linked to beneficial reduction in systemic inflammation and immune activation in ART-treated HIV+ individuals. These reports suggest that the modulatory functions of cocaine and cannabis on host cells may regulate HIV pathogenesis. Indeed, despite the similarities in physical characteristics of EVs from HIV infected and uninfected persons or psychostimulant users and non-users, we showed that BEVs and SEVs differ in their electrostatic surface properties, with consequences to EV internalization and that HIV infection more significantly altered SEV surface charge compared to BEV charge. We also showed that SEVs from users of psychostimulants have decreased levels of CD9 and CD63 EV markers—an observation that is coincident with the loss of SEV-mediated inhibition of HIV. Furthermore, we showed that HIV infection and use of psychostimulants promote secretion of SEVs that enhance cell adhesion, induce actin reorganization, enhance secretion of metalloproteases and chemotactic migration. In addition, we recently showed that the anti-inflammatory effects of long-term low dose THC was

associated with its ability to stimulate the release of bioactive BEVs that induced divergent actin cytoskeletal and signaling cues in a RM model of SIV infection.

a. Kaddour H, Panzner TD, Welch JL, Shouman N, Mohan M, Stapleton JT, **Okeoma CM.** Electrostatic Surface Properties of Blood and Semen Extracellular Vesicles: Implications of Sialylation and HIV-Induced Changes on EV Internalization. Viruses. 2020. PMID: 33019624.
b. Lyu Y, Kopcho S, Mohan M, **Okeoma CM.** Long-Term Low-Dose Delta-9-Tetrahydrocannbinol (THC) Administration to Simian Immunodeficiency Virus (SIV) Infected Rhesus Macaques Stimulates the Release of Bioactive Blood Extracellular Vesicles (EVs) that Induce Divergent Structural Adaptations and Signaling Cues. Cells. 2020. PMID: 33036231.
c. Lyu Y, Kaddour H, Kopcho S, Panzner TD, Shouman N, Kim EY, Martinson J, McKay H, Martinez-Maza O, Margolick JB, Stapleton JT, **Okeoma CM.** Human Immunodeficiency Virus (HIV) Infection and Use of Illicit Substances Promote Secretion of Semen Exosomes that Enhance Monocyte Adhesion and Induce Actin Reorganization and Chemotactic Migration. Cells. 2019 PMID: 31484431
d. Welch JL, Madison MN, Margolick JB, Galvin S, Gupta P, Martínez-Maza O, Dash C**, Okeoma CM.** Effect of prolonged freezing of semen on exosome recovery and biologic activity. Scientific Reports 2017. PMID: 28338013.

Demonstration that exosomes in human semen contain Anti-HIV factors: Despite the fact that semen is the primary vector for HIV transmission, the low infection rates for seminal transmission of HIV spurred our curiosity that semen may contain protective properties. Our research efforts have resulted in significant findings. We discovered that human semen contains extracellular vesicles with HIV inhibitors and that these SE “Super Inhibitory Factors” (SESIF) arrest HIV replication via multiple mechanisms, including inhibition of HIV reverse transcription and proviral transcription. Inhibition of HIV is a general feature of SESIF against all HIV strains, which we documented in transformed cells and ex vivo primary cell models (Madison et al., 2014, Madison et al., 2015, Welch et al., 2017). This revolutionary discovery suggests a possibility that the anti-HIV factor(s) in SESIF can be exploited for the development of novel therapeutics for HIV-1.

a. Welch JL, Madison MN, Margolick JB, Galvin S, Gupta P, Martínez-Maza O, Dash C, **Okeoma CM.** Effect of prolonged freezing of semen on exosome recovery and biologic activity. Scientific Reports; 2017. Sci. Rep. 7, 45034; doi: 10.1038/srep45034. PMCID: Pmc5364471.
b. Madison MN, Jones PH, **Okeoma CM.** Exosomes in human semen restrict HIV-1 transmission by vaginal cells and block intravaginal replication of LP-BM5 murine AIDS virus complex. Virology. 2015. PMCID: Pmc4461544.
c. Madison MN, Roller RJ, **Okeoma CM.** Human semen contains exosomes with potent anti-HIV-1 activity. Retrovirology. 2014. PMCID: Pmc4245725.

Development of a proteomics approach to study EVs and their spatiotemporal adaptations to the host environment: EVs carry markers of the producer cells from which they originate. As a result, if the producer cells are healthy or pathologic, EVs will carry markers corresponding to the state of the producer cells. Throughout life, EVs monitor and adapt to environmental signals, and therefore serve as a window into host’s health and disease states. Blood and semen are important body fluids that carry EVs and use them for bioinformation transmission. Therefore, characterization of their proteomes is necessary for understanding body-fluid-specific physiologic and pathophysiologic functions. We developed a systematic multifactorial proteomic profiling as an analytical approach for analysis of proteomic datasets. We used this approach to characterize the proteomes of BEVs and SEVs as well as their EV-free fractions from autologous blood and semen obtained from HIV-uninfected and HIV-infected men. We identified EV-based protein signatures specific to blood and semen along with HIV-induced tissue-dependent proteomic perturbations in EV composition and functions. Data from this

analytical approach revealed that SEVs but not BEVs promote Protein•Nucleic acid binding and increase cell adhesion irrespective of HIV infection. This is the first comparative study of the proteome of autologous BEVs and SEVs that shows that the environment tunes EV variations. Publication of our comparative BEV:SEV proteome also generated huge excitement in the field (https://www.asbmb.org/asbmb-today/science/from-the-journals-mcp-012520). The proteins identified may be developed as biomarkers applicable to different fields of medicine, including reproduction and infectious diseases.

a. Kaddour H, Lyu Y, Welch JL, Paromov V, Mandape SN, Sakhare SS, Pandhare J, Stapleton JT, Pratap S, Dash C, **Okeoma CM.** Proteomics profiling of autologous blood and semen exosomes from HIV-infected and uninfected individuals reveals compositional and functional variabilities. Mol Cell Proteomics. 2020 PMID: 31676584.

5. *Discovery that semen exosomes arrest HIV transcription and impair the functions of host transcription factors necessary for HIV to replicate:* We used various experimental models to show that SEVs block HIV-1 proviral transcription at multiple transcriptional check points, including transcription factor recruitment to the LTR, and transcription initiation and elongation. Biochemical and functional studies show that SEVs inhibit HIV-1 long terminal repeat (HIV-LTR)-driven viral gene expression and virus replication. Through partitioning of the HIV-1 RNA, we found that SEVs reduced the optimal expression of various viral RNA species. CHIP-RT-qPCR and EMSA analyses of infected cells identified human transcription factors NF-kB and Sp1, as well as RNA Pol II and the viral protein Tat as targets of SEVs. Of interest, SEVs inhibit HIV-1 LTR activation mediated by HIV-1 or Tat and block the DNA binding activities of NF-kB and Sp1, as well as recruitment of these transcription factors and Pol II to the HIV LTR promoter. These multi-faceted mechanisms indicate that SEVs utilize multiple approaches in its repression of HIV transcription and highlight Tat as a potential target of SEVs. These findings created a huge excitement in the field as evidenced by the Journal of Virology "articles of significant interest in this issue" https://jvi.asm.org/content/92/21/e01514-18

   a. Welch JL, Kaddour H, Schlievert PM, Stapleton JT, **Okeoma CM.** Semen exosomes promote transcriptional silencing of HIV-1 by disrupting NF-kB/Sp1/Tat circuitry. J Virol; 2018. PMCID: Pmc6189507

6. *Discovery of the pro tumor role of BST-2:* BST-2 is an interferon-inducible protein renowned for its ability to tether a wide array of enveloped viruses to the cell membrane. BST-2 is also known for its anti-viral functions because its expression impairs replication of viruses, including MMTV (Jones et al., 2012) both in cultured cells and in mice. You would then expect that the principle role of BST-2 is in host protection, but that's not the case. Recent discoveries from my laboratory have revealed the detrimental effects of BST-2. We found that breast tumor tissues have elevated BST-2. Elevated BST-2 expression promotes the ability of cells to adhere to extracellular matrix proteins and to each other enhancing cell to cell interaction. In addition, increased BST-2 expression promotes cell migration and invasion through extracellular matrix barrier. The cumulative effect of BST-2-mediated modulation of these cellular behaviors is increased primary breast tumor growth and metastatic progression to secondary sites (Mahauad-Fernandez et al., 2014). While types I and II interferon have been shown to induce BST-2 expression, our recent published evidence reveals that in tumors and cancer cells, BST-2 expression is epigenetically regulated. We showed that BST-2 expression is inversely proportional to the methylation status of CpGs located inside and in proximity to the BST-2 promoter region (Mahauad-Fernandez et al., 2015). These groundbreaking studies reveal that understanding BST-2 biology and function is paramount to developing BST-2-based therapeutics.

   a. Mahauad-Fernandez WD, **Okeoma CM.** Cysteine-linked dimerization of BST-2 confers anoikis resistance to breast cancer cells by negating proapoptotic activities to promote tumor cell survival and growth. Cell Death & Disease; 2017, 8, doi:10.1038/cddis.2017.68. PMID: 28300825

b. Naushad W, Mahauad-Fernandez WD, **Okeoma CM.** Structural determinant of BST-2-mediated regulation of breast cancer cell motility: a role for cytoplasmic tail tyrosine residues. Oncotarget. 2017. 8(66):110221-110233. doi: 10.18632/oncotarget.22753. PMID: 29299143
c. Mahauad-Fernandez WD, Borcherding NC, Zhang W, **Okeoma CM.** Bone marrow stromal antigen 2 (BST-2) DNA is demethylated in breast tumors and breast cancer cells. PLoS One. 2015;10(4):e0123931. PubMed PMID: 25860442; PubMed Central PMCID: PMC4393144.
d. Mahauad-Fernandez WD, DeMali KA, Olivier AK, **Okeoma CM.** Bone marrow stromal antigen 2 expressed in cancer cells promotes mammary tumor growth and metastasis. Breast Cancer Res. 2014 Dec 13;16(6):493. PubMed PMID: 25499888; PubMed Central PMCID: PMC4308845.

7. *Development of a BST-2-based anti-cancer peptide:* Leveraging our extensive knowledge of BST-2 both from virology and cancer biology perspectives, we have developed a patented BST-2-base peptide B49 (WO2017/011375) and its first generation analog B49Mod1. We have shown in a published manuscript that B49 and B49Mod1 potently inhibit breast cancer cell adhesion to other cancer cells or components of the tumor microenvironment. In our studies, we found that B49 and B49Mod1 significantly inhibit spheroid formation, anchorage-independent, and primary tumor growth, suggesting that B49 and its analogs offer a promising anti-adhesion and therapeutic lead for BST-2-dependent cancers.
   a. Mahauad-Fernandez, **Okeoma CM.** B49, a BST-2-based peptide, inhibits adhesion and growth of breast cancer cells. Sci Rep. 2018 Mar 9;8(1):4305. doi: 10.1038/s41598-018-22364-z. PubMed PMID: 29523843 PMCID: PMC5844955.
   b. Lyu Y, Mahauad-Fernandez WD, **Okeoma CM.** Development and Characterization of the Shortest Anti-Adhesion Peptide Analogue of B49Mod1. Molecules. 2020 Mar 6;25(5). pii: E1188. doi: 10.3390/molecules25051188. PubMed PMID: 32155736
   c. Lyu Y, Kopcho S, Alvarez FA, Okeoma BC, **Okeoma CM.** Development of a Cationic Amphiphilic Helical Peptidomimetic (B18L) As A Novel Anti-Cancer Drug Lead. Cancers (Basel). 2020 Aug 28;12(9):E2448. doi: 10.3390/cancers12092448. PubMed PMID: 32872253

As we continue our scholarly activity, our mission is to understand how cellular components and extracellular structures cooperate to produce spatiotemporal behaviors observed in physiological and pathophysiological states. Below is the summary of our current focus:

1: Investigate EVs and their spatiotemporal adaptations to the host environment
2: Investigate EVs as conduits by which viral- and/or psychostimulant- induced epigenetic mechanisms lead to biological changes that alter host responses and disease progression
3: Development of Methods and Resources for EV studies
4: Using BST2 as a model for identifying drivers of molecular conflicts and mutually antagonistic relationships (antiviral, proviral, oncogenic functions)
5: Continue the development of BST2-based anticancer peptides

Complete List of Published Work and details of research activities can be viewed below:
Lab:
https://renaissance.stonybrookmedicine.edu/pharmacological_sciences/okeoma_lab/research
PubMed: https://pubmed.ncbi.nlm.nih.gov/?term=Okeoma+CM&sort=date&size=100
Google Scholar: https://scholar.google.com/citations?hl=en&user=G1Ey3b0AAAAJ&view

PUBLICATIONS IN REFEREED JOURNALS:
https://www.ncbi.nlm.nih.gov/pubmed/?term=Okeoma+CM

ARTICLES

ORIGINAL ARTICLES:

1. Duignan PJ, Hine PM, Joy M, Gibbs N, Jones GW, **Okeoma C.** 2003. Disease surveillance in fresh water fish from the lower North Island of New Zealand, Surveillance. 30, 3, 6-8.

2. **Okeoma CM**, Williamson NB, Pomroy WE, Stowell KM. 2004. Recognition patterns of Neospora caninum tachyzoite antigens by bovine IgG at different IFAT titres. Parasite immunology 26:177-185. PMID: 15367295

3. **Okeoma CM**, Williamson NB, Pomroy WE, Stowell KM, Gillespie L. 2004. The use of PCR to detect Neospora caninum DNA in the blood of naturally infected cows. Veterinary parasitology 122:307-315. PMID: 15262009

4. **Okeoma CM**, Williamson NB, Pomroy WE, Stowell KM, Gillespie LM. 2004. Isolation and molecular characterisation of Neospora caninum in cattle in New Zealand. New Zealand veterinary journal 52:364-370. PMID: 15768137

5. **Okeoma CM**, Stowell KM, Williamson NB, Pomroy WE. 2005. Neospora caninum: quantification of DNA in the blood of naturally infected aborted and pregnant cows using real-time PCR. Experimental parasitology 110:48-55. PMID: 15804378

6. **Okeoma CM**, Lovsin N, Peterlin BM, Ross SR. 2007. APOBEC3 inhibits mouse mammary tumour virus replication in vivo. Nature 445:927-930. PMID: 17259974

7. **Okeoma CM**, Shen M, Ross SR. 2008. A novel block to mouse mammary tumor virus infection of lymphocytes in B10.BR mice. J Virol 82:1314-1322. PMID: 18003725

8. Low A, **Okeoma CM**, Lovsin N, de las Heras M, Taylor TH, Peterlin BM, Ross SR, Fan H. 2009. Enhanced replication and pathogenesis of Moloney murine leukemia virus in mice defective in the murine APOBEC3 gene. Virology 385:455-463. PMID: 19150103

9. **Okeoma CM**, Low A, Bailis W, Fan HY, Peterlin BM, Ross SR. 2009. Induction of APOBEC3 in vivo causes increased restriction of retrovirus infection. J Virol 83:3486-3495. PMID: 19153238

10. **Okeoma CM**, Petersen J, Ross SR. 2009. Expression of murine APOBEC3 alleles in different mouse strains and their effect on mouse mammary tumor virus infection. J Virol 83:3029-3038. PMID: 19153233

11. **Okeoma CM**, Huegel AL, Lingappa J, Feldman MD, Ross SR. 2010. APOBEC3 proteins expressed in mammary epithelial cells are packaged into retroviruses and can restrict transmission of milk-borne virions. Cell Host Microbe 8:534-543. PMID: 21147467

12. Jones PH, Mehta HV, Maric M, Roller RJ, **Okeoma CM**. 2012. Bone marrow stromal cell antigen 2 (BST-2) restricts mouse mammary tumor virus (MMTV) replication in vivo. Retrovirology 9:10. PMID: 22284121

13. Jones PH, Mehta HV, **Okeoma CM**. 2012. A novel role for APOBEC3: susceptibility to sexual transmission of murine acquired immunodeficiency virus (mAIDS) is aggravated in APOBEC3 deficient mice. Retrovirology 9:50. PMID: 22691411

14. Mehta HV, Jones PH, Weiss JP, **Okeoma CM**. 2012. IFN-α and lipopolysaccharide upregulate APOBEC3 mRNA through different signaling pathways. J Immunol. 189:4088-4103. PMID: 22972924

15. Jones PH, Mahauad-Fernandez WD, Madison MN, **Okeoma CM**. 2013. BST-2/tetherin is overexpressed in mammary gland and tumor tissues in MMTV-induced mammary cancer. Virology 444:124-139. PMID: 23806386

16. Jones PH, Maric M, Madison MN, Maury W, Roller RJ, **Okeoma CM**. 2013. BST-2/tetherin-mediated restriction of chikungunya (CHIKV) VLP budding is counteracted by CHIKV non-structural protein 1 (nsP1). Virology 438:37-49. PMID: 23411007

17. Jones PH, **Okeoma CM**. 2013. Phosphatidylinositol 3- kinase is involved in Toll-like receptor 4-mediated BST-2/Tetherin regulation. Cellular signalling. 25:12. PMID: 24036213

18. Madison MN, Roller RJ, **Okeoma CM**. 2014. Human semen contains exosomes with potent anti-HIV-1 activity. Retrovirology 11:102. PMID: 25407601

19. Mahauad-Fernandez WD, DeMali KA, Olivier AK, **Okeoma CM**. 2014. Bone marrow stromal antigen 2 expressed in cancer cells promotes mammary tumor growth and metastasis. Breast cancer research: BCR 16:493. PMID: 25499888

20. Mahauad-Fernandez WD, Jones PH, **Okeoma CM**. 2014. Critical role for bone marrow stromal antigen 2 in acute Chikungunya virus infection. J Gen Virol 95:2450-2461. PMID: 25053563

21. Mahauad-Fernandez WD, Borcherding NC, Zhang W, **Okeoma CM**. 2015. Bone marrow stromal antigen 2 (BST-2) DNA is demethylated in breast tumors and breast cancer cells. PLoS One. 10(4):e0123931. PMID: 25860442

22. Madison MN, Jones PH, **Okeoma CM**. 2015. Exosomes in human semen restrict HIV-1 transmission by vaginal cells and block intravaginal replication of LP-BM5 murine AIDS virus complex. Virology 482:189-201. PMID: 25880110

23. Jones PH, **Okeoma CM**. 2015. Detection of Chikungunya virus (CHIKV) in urine of infected mice: a Potential Non-invasive Diagnostic Tool for CHIKV. J Infect Dis Ther 3: 226. doi:10.4172/2332-0877.1000226.

24. Mahauad-Fernandez WD, **Okeoma CM**. 2017. Cysteine-linked dimerization of BST-2 confers anoikis resistance to breast cancer cells by negating proapoptotic activities to promote tumor cell survival and growth. Cell Death & Disease 8, doi:10.1038/cddis.68. PMID: 28300825

25. Welch JL, Madison MN, Margolick JB, Galvin S, Gupta P, Martínez-Maza O, Dash C, **Okeoma CM**. 2017. Effect of prolonged freezing of semen on exosome recovery and biologic activity. Scientific Reports 24;7:45034. doi: 10.1038/srep45034. PMID: 28338013

26. Madison MN, Welch JL, **Okeoma CM**. 2017. Isolation of Exosomes from Semen for in vitro Uptake and HIV-1 Infection Assays. Bio Protoc. 7(7). pii: e2216. doi: 10.21769/BioProtoc.2216.

PMID: 28660234

27. Naushad W, Mahauad-Fernandez WD, **Okeoma CM**. 2017. Structural determinant of BST-2-mediated regulation of breast cancer cell motility: a role for cytoplasmic tail tyrosine residues. Oncotarget. 8(66). 110221-110233. doi: 10.18632/oncotarget.22753. PMID: 29299143

28. Mahauad-Fernandez WD, **Okeoma CM**. 2018. B49, a BST-2-based peptide, inhibits adhesion and growth of breast cancer cells. Sci Rep. 8(1):4305. doi: 10.1038/s41598-018-22364-z. PMID: 29523843

29 Mahauad-Fernandez WD, Naushad W, Panzner TD, Bashir A, Lal G, **Okeoma CM**. 2018. BST-2 promotes survival in circulation and pulmonary metastatic seeding of breast cancer cells. Sci Rep. 2018 Dec 4;8(1):17608. doi: 10.1038/s41598-018-35710-y. PMCID: PMC6279795

30. Welch JL, Kaddour H, Schlievert PM, Stapleton JT, **Okeoma CM**. 2018. Semen Exosomes Promote Transcriptional Silencing of HIV-1 by Disrupting NF-κB/Sp1/Tat Circuitry. J Virol. 2018 Oct 12;92(21). pii: e00731-18. doi: 10.1128/JVI.00731-18. Print 2018 Nov 1. PMCID: PMC6189507

31. Lyu Y, Kaddour H, Kopcho S, Panzner TD, Shouman N, Kim EY, Martinson J, McKay H, Martinez-Maza O, Margolick JB, Stapleton JT, **Okeoma CM**. 2019. Human Immunodeficiency Virus (HIV) Infection and Use of Illicit Substances Promote Secretion of Semen Exosomes that Enhance Monocyte Adhesion and Induce Actin Reorganization and Chemotactic Migration. Cells. 2019 Sep 3;8(9). pii: E1027. doi: 10.3390/cells8091027. PMID: 31484431

32. Kaddour H, Lyu Y, Welch JL, Paromov V, Mandape SN, Sakhare SS, Pandhare J, Stapleton JT, Pratap S, Dash C, **Okeoma CM**. 2019. Proteomics profiling of autologous blood and semen exosomes from HIV-infected and uninfected individuals reveals compositional and functional variabilities. Mol Cell Proteomics. 2019 Nov 1. pii: mcp.RA119.001594. doi: 10.1074 PMID: 31676584

33. Welch JL, Kaufman TM, Stapleton JT, **Okeoma CM**. 2019. Semen exosomes inhibit HIV infection and HIV-induced proinflammatory cytokine production independent of the activation state of primary lymphocytes. FEBS Lett. 2019 Oct 30. doi: 10.1002/1873-3468.13653. [Epub ahead of print] PMID: 31665815.

34. Welch JL, Kaddour H, Winchester, LC, Fletcher, C, Stapleton JT, **Okeoma CM**. 2020. Semen extracellular vesicles from HIV-1 infected individuals inhibit HIV-1 replication in vitro, and extracellular vesicles carry antiretroviral drugs in vivo. . J Acquir Immune Defic Syndr 2020; 83:90–98.

35. Mohammed S, Shamseddine AA, Newcomb B, Chavez RS, Panzner TD, Lee AH, Canals D, **Okeoma CM**, Clarke CJ, Hannun YA. 2021. Sublethal doxorubicin promotes migration and invasion of breast cancer cells: role of Src Family non-receptor tyrosine kinases. Breast Cancer Res. 2021. 23(1):76. doi: 10.1186/s13058-021-01452-5.

36. McDew-White M, Lee E, Alvarez X, Sestak K, Ling BJ, Byrareddy SN, **Okeoma CM**, Mohan M. 2021. Cannabinoid control of gingival immune activation in chronically SIV-infected rhesus macaques involves modulation of the indoleamine-2,3-dioxygenase-1 pathway and salivary microbiome. EBioMedicine. 2021; 75:103769. doi: 10.1016/j.ebiom.2021.103769.

37. Kaddour H, Kopcho S, Lyu Y, Shouman N, Paromov V, Pratap S, Dash C, Kim EY, Martinson J, McKay H, Epeldegui M, Margolick JB, Stapleton JT, **Okeoma CM**. 2021. HIV-infection and cocaine use regulate semen extracellular vesicles proteome and miRNAome in a manner that mediates strategic monocyte haptotaxis governed by miR-128 network. Cell Mol Life Sci. 2021 79(1):5. doi: 10.1007/s00018-021-04068-2.

JOURNAL COVERS:

1. Elsevier - Virology Volume 438, Issue 1, 30 March 2013, Pages 37–49

REVIEW ARTICLES:

1. Madison MN, **Okeoma CM**. Exosomes: Implications in HIV-1 Pathogenesis. 2015. Viruses 7(7):4093-118. doi: 10.3390/v7072810. PMID: 26205405

2. Mahauad-Fernandez WD, **Okeoma CM**. The role of BST-2/Tetherin in host protection and disease manifestation. 2015. Immunity, Inflammation and Disease. 4(1):4-23. doi: 10.1002/iid3.92. eCollection 2016 Mar. PMID: 27042298

3. Mahauad-Fernandez WD, **Okeoma CM**. BST-2: at the crossroads of viral pathogenesis and oncogenesis. 2016. Future Virology 11:127-140.

4 Welch JL, Stapleton JT, **Okeoma CM**. Vehicles of intercellular communication: exosomes and HIV-1. 2019. J Gen Virol.;100(3):350-366. doi: 10.1099/jgv.0.001193. Epub 2019 Jan 31. PMID: 30702421

5 Kaddour H, Tranquille M, **Okeoma CM**. The Past, the Present, and the Future of the Size Exclusion Chromatography in Extracellular Vesicles Separation. 2021. Viruses. 2021. 13(11):2272. doi: 10.3390/v13112272

CONTRIBUTED BOOK CHAPTERS:

1. **Okeoma CM**. and Ross, S.R. 2011. Genetics of host resistance to retroviruses and cancer. In Retroviruses and Insights into Cancer, Dudley, J.P., Ed.; Springer Science and Business Media: N.Y., USA

2. Mahauad-Fernandez W.D. and **Okeoma CM**. 2016. Restriction Factors and Chikungunya virus. In Chikungunya virus: Advances in Biology, Pathogenesis, and Treatment, Okeoma C.M. Ed., Springer Science and Business Media: N.Y., USA.

BOOKS EDITED:

1. Chikungunya virus: Advances in Biology, Pathogenesis, and Treatment: **Okeoma CM**. Ed.; Springer Science and Business Media: N.Y., USA 2016.

PRESENTATIONS
LECTURESHIPS, SEMINAR INVITATIONS:

2013 Departmental Seminar, University of Rochester, Rochester, NY. APOBEC3 Proteins: role in sexual transmission of retroviruses.

2013 Summer Scholars Program, University of Rochester, Rochester, NY. Science & Family: Overcoming the Obstacles.

2015 Black Girls Do Science: Summer program. University of Iowa, Iowa City, IA. Overcoming the Obstacles: The Egg Model.

2015 African American Museum of Iowa. Inventors and their inventions: Cataracts and Dr. Patricia Bath – The Laserphaco Probe inventor.

2015 African American Museum of Iowa. Inventors and their inventions: Blood and Dr. Charles Drew – The blood bank inventor.

2015 American Society for Virology (ASV) 34rd Annual Meeting, Western University London ON CA. Invited host “Meet the Speakers”.

2015 American Society for Virology (ASV) 34rd Annual Meeting, Western University London ON CA. Invited Key note speaker. BST-2/Tetherin: At the crossroads of viral pathogenesis and oncogenesis.

2016 Cancer Center seminar, Stony Brook University, Stony Brook, NY. BST-2 at the nexus of viral pathogenesis and cancer

2016 Stony Brook University, Department of Pharmacological Sciences, Stony Brook, NY. BST-2 and cancer: Any therapeutic promise?

2017 Meharry Medical College. Center for AIDS Health Disparities Research (CAHDR), Nashville, TN. Dynamics of semen exosome-mediated HIV inhibition.

2020 40th Annual Meeting of the American Society for Reproductive Immunology, Santa Fe, New Mexico.

2020 Chronic HIV and Aging in NeuroAIDS and Nebraska Center for Substance Abuse Research (2020 CHAIN-NSCAR) Colloquium.

2022 Keystone Symposia. Exosomes, Microvesicles and Other Extracellular Vesicles

2022 22nd Annual Rocky Mountain Virology Association meeting

INVITATIONS TO NATIONAL OR INTERNATIONAL CONFERENCES:

2011 Cold Spring Harbor Retrovirus Meeting, Cold Spring Harbor, NY. BST-2 potently restricts mouse mammary tumor virus infection in vivo.

2012 American Society for Virology, Madison, WI. Mouse mammary tumor virus-induced

modulation of APOBEC3 gene expression in vivo.

2012 American Society for Virology, Madison, WI. IFNα and LPS up-regulate APOBEC3 mRNA by different signaling mechanisms.

2012 American Society for Virology, Madison, WI. Bone marrow stromal cell antigen 2 (BST-2) tethers mouse mammary tumor virus (MMTV) and restricts replication in vivo.

2012 Cold Spring Harbor Retrovirus Meeting, Cold Spring Harbor, NY. IFNα and LPS up-regulate APOBEC3 mRNA by different signaling mechanisms.

2012 Cold Spring Harbor Retrovirus Meeting, Cold Spring Harbor, NY. A novel role for APOBEC3: Restriction of sexual virus transmission.

2013 Cold Spring Harbor Retrovirus Meeting, Cold Spring Harbor, NY. Mouse mammary tumor virus (MMTV) modulates BST-2/tetherin expression and antiviral activity in a TLR4 dependent manner.

2013 Cold Spring Harbor Retrovirus Meeting, Cold Spring Harbor, NY. Differential modulation of APOBEC3F/G expression by Dexamethasone in PBMCs of HIV-1 infected donors.

2013 Cold Spring Harbor Retrovirus Meeting, Cold Spring Harbor, NY. BST-2/tetherin is differentially expressed during MMTV infection and MMTV-induced mammary carcinogenesis and expression in mammary carcinoma epithelial cells is regulated by Phosphatidylinositol 3-kinase (Pl3K).

2013 Cold Spring Harbor Retrovirus Meeting, Cold Spring Harbor, NY. BST-2/tetherin function and modulation: Perspectives from an alpha and a retro virus.

2014 Cold Spring Harbor Mechanisms & Models of Cancer Meeting, Cold Spring Harbor, NY. High levels of BST-2 (Tetherin) in tumor cells confer increased aggressiveness and poor prognosis in breast cancer.

2014 Cold Spring Harbor Mechanisms & Models of Cancer Meeting, Cold Spring Harbor, NY. Molecular basis of BST-2 (Tetherin) driven breast malignancy.

2014 American Society for Virology (ASV) 33rd Annual Meeting, Colorado State University, Fort Collins, CO. Absence of TLR4-mediated signaling enhances Chikungunya virus replication in vivo.

2015 American Society for Virology (ASV) 34rd Annual Meeting, Western University London ON CA. Semen-derived exosomes and their role in HIV entry and replication.

2015 American Society for Virology (ASV) 34rd Annual Meeting, Western University London ON CA. The role of BST-2 in MMTV-mediated breast cancer development.

2016 Developing targeted novel therapy for metastatic breast cancer, NSF I-Corps, Georgia Tech, Atlanta GA.

2016 Keystone Symposia, Semen exosomes: Effect on human immunodeficiency virus type 1 (HIV-1) RNA.

2017 National Institute on Drug Abuse (NIDA) Genetics Consortium Meeting, Bethesda, MD. Cocaine alters semen exosome cargo composition and anti-HIV activity.

2017 American Society of Exosomes and Microvesicles Annual Meeting, Asilomar, Pacific Grove, CA. The intricacies of exosomes in varied biological systems.

2017 American Society of Exosomes and Microvesicles Annual Meeting, Asilomar, Pacific Grove, CA. Chair Session IX of The American Society for Exosomes and Microvesicles (ASEMV).

2018 NIDA Genetics Consortium Annual Meeting, North Bethesda, MD. HIV and substance abuse may influence the evolution of exosomes (exosome speciation): Implication for biosignature.

2018 American Society of Exosomes and Microvesicles Annual Meeting, Marriott Waterfront Conference Center in Baltimore, Maryland, USA. Comparative and integrative proteomics of blood and semen identifies tissue-specific extracellular markers enriched in healthy and disease states.

2018 American Society of Exosomes and Microvesicles Annual Meeting, Marriott Waterfront Conference Center in Baltimore, Maryland, USA. Semen Exosomes (SE) contain inhibitors of HIV-1 Reverse Transcriptase Activity.

2018 American Society of Exosomes and Microvesicles Annual Meeting, Marriott Waterfront Conference Center in Baltimore, Maryland, USA. Exosomes in semen inhibit HIV-1 independent of exosome-mediated immune regulation.

2018 American Society of Exosomes and Microvesicles Annual Meeting, Marriott Waterfront Conference Center in Baltimore, Maryland, USA. HIV-1-suppressed patients' plasma and semen exosomes contain protective levels of anti-retroviral (ART) drugs.

2018 American Society of Exosomes and Microvesicles Annual Meeting, Marriott Waterfront Conference Center in Baltimore, Maryland, USA. Mapping HIV-induced modifications in blood and semen exosomes surface charge.

2018 American Society of Exosomes and Microvesicles Annual Meeting, Marriott Waterfront Conference Center in Baltimore, Maryland, USA. The role of BST-2-expressing extracellular vesicles in cancer cell proliferation.

2018 American Society of Exosomes and Microvesicles Annual Meeting, Marriott Waterfront Conference Center in Baltimore, Maryland, USA. Bone Marrow Stromal Antigen 2 (BST-2) promotes breast cancer invasion through extracellular vesicles.

2019 Conference on Retroviruses and Opportunistic Infections (CROI) in Seattle, Washington. HIV suppressed patients' plasma and semen exosomes contain protective levels of ART

UNIVERSITY OF IOWA AND IOWA STATE SEMINARS AND CONFERENCES:

2010 All Iowa Virology Symposium, University of Iowa, Iowa City, IA. APOBEC3 proteins expressed in mammary epithelia cells function to restrict milk-borne virus infections.

2010 Graduate Student orientation, University of Iowa, Iowa City, IA. Role of cytokine induction in APOBEC3-mediated virus restriction.

2011 Molecular and Cellular Biology Seminar series, University of Iowa, Iowa City, IA. BST-2/Tetherin potently inhibits virus replication in vivo.

2011 Graduate Student orientation, University of Iowa, Iowa City, IA. Regulation of human APOBEC3 (A3) proteins during HIV-1 infection.

2012 Biosciences Interview Weekend, University of Iowa, Iowa City, IA. Virus Restriction Factors: Future hope for antiviral therapies.

2013 All Iowa Virology Symposium, Iowa State University, Ames, IA. Dexamethasone modulation of APOBEC3 expression and effect on latent HIV infection.

2012 Summer Research Experience for Undergraduates in Microbiology, University of Iowa, Iowa City, IA. Interaction of Chikungunya Virus with Toll-Like Receptor 4.

2012 Summer Research Experience for Undergraduates in Microbiology, University of Iowa, Iowa City, IA. Genetics of Resistance and Susceptibility to Viral Infections.

2012 Infectious diseases research conference, University of Iowa, Iowa City, IA. APOBEC3 protein and Sexual transmission of retroviruses: Lessons from the mouse.

2012 Immunology Seminar Series, University of Iowa, Iowa City, IA. Regulation of APOBEC3 Expression.

2012 HCCC Forum, University of Iowa, Iowa City, IA. Host virus restriction factors: Intrinsic protective systems against Virus-induced tumor.

2012 Graduate Student orientation, University of Iowa, Iowa City, IA. Host virus restriction factors: Intrinsic protective systems against Virus-induced tumor.

2013 Interdisciplinary Graduate Program in Immunology, University of Iowa, Iowa City, IA. Chikungunya non-structural protein 1 antagonizes BST-2 mediated tethering of Chikungunya virus-like particle.

2013 Immunology Seminar Series, University of Iowa, Iowa City, IA. Chikungunya non-structural protein 1 antagonizes BST-2 mediated tethering of Chikungunya virus-like particle.

2013 Graduate Student orientation, University of Iowa, Iowa City, IA. Dexamethasone modulation of APOBEC3 expression and effect on latent HIV infection.

2014 University of Iowa, 2014 Health Sciences Research Week. Human semen-derived exosomes suppress HIV-1 infectivity in a murine AIDS model of sexual transmission.

2014 University of Iowa Biosciences Interview Weekend. Human semen-derived exosomes

suppress HIV-1 infectivity in a murine AIDS model of sexual transmission.

2015 Molecular and Cellular Biology Seminar series, University of Iowa, Iowa City, IA. Semen Exosomes: Friend or Foe in HIV Transmission.

2015 University of Iowa, Holden Comprehensive Cancer Center seminar series, Dimerization of BST-2/tetherin is important for breast tumor growth and progression.

2015 BST-2/Tetherin: At the crossroads of viral pathogenesis and carcinogenesis.

2015 University of Iowa, Molecular and Cellular Biology seminar series, University of Iowa, Iowa City, IA. Semen Exosomes: Friend or Foe in HIV Transmission.

2014 University of Iowa, Department of Microbiology, HIV Works In Progress Series. Human semen-derived exosomes suppress HIV-1 infectivity and sexual transmission of mAIDS virus.

2014 University of Iowa, Division of Infectious Diseases Research Conference. Human semen-derived exosomes suppress HIV-1 infectivity and sexual transmission of mAIDS virus.

2015 All Iowa Virology Symposium, University of Iowa, Iowa City, IA. Semen-derived exosomes and their role in HIV entry and replication.

2015 All Iowa Virology Symposium, University of Iowa, Iowa City, IA. Characterization of BST-2-induced breast tumors in a murine breast cancer model.

2015 All Iowa Virology Symposium, University of Iowa, Iowa City, IA. Complex host genetics modulate innate response to chikungunya virus: Roles for BST-2 and type I interferon receptor.

2015 All Iowa Virology Symposium, University of Iowa, Iowa City, IA. The role of BST-2 in MMTV-mediated breast cancer development.

2015 University of Iowa, Division of Infectious Diseases Research Conference. Semen exosomes (SE) mediated regulation of HIV-1 gene expression.

2017 All Iowa Virology Symposium, University of Iowa, Iowa City, IA. BST-2/Tetherin potentiates motility of virus infected cells to promote virus dissemination.

2017 All Iowa Virology Symposium, University of Iowa, Iowa City, IA. Functional cargo of human semen exosomes impairs HIV-1 infectivity by reducing HIV-1 RNA.

2017 University of Iowa, Holden Comprehensive Cancer Center retreat, Iowa City, IA. BST-2: A potential target for breast cancer treatment.

2019 All Iowa Virology Symposium, University of Iowa, Iowa City, IA. HIV suppressed patients' plasma and semen exosomes contain protective levels of ART.

STONY BROOK UNIVERSITY SEMINARS AND CONFERENCES:

2017 Stony Brook University Pharmacological Sciences retreat, Stony Brook, NY. BST-2: The role of host factors in human health and disease.

2019 Stony University: Invitation to present to students in the Honors College. “What’s lurking in your body fluids? Get to know extracellular vesicles (EVs) and their functions”

2019 Stony University: DoM Research Seminar. Semen exosome-mediated inhibition of HIV: A tale of two vesicles

2019 Stony Brook University: Panelist, Advocates of Women in Science and Medicine Symposium

2019 Microbiology Department’s Annual Retreat: Seminal extracellular vesicles (SEVs) and inhibition of HIV infection