

SHSU VITA**I. Academic/Professional Background**A. Name: **RASHEDA SULTANA***Title: Visiting Assistant Professor***B. Educational Background**

<i>Degree</i>	<i>Year</i>	<i>University</i>	<i>Major</i>
Ph.D.	2012	City University of New York	Biochemistry
M.Phil.	2011	City University of New York	Biochemistry
M.Sc.	1998	University of Dhaka	Biochemistry
B.Sc.	1995	University of Dhaka	Biochemistry

C. University Experience

<i>Position</i>	<i>University</i>	<i>Dates</i>
Visiting Assistant Professor	Sam Houston State University	8/17/20 - present
Lecturer	Indiana University Bloomington	12/1/14 - 8/15/20
Postdoctoral Researcher	University of Iowa	15/10/12 - 6/30/14
Adjunct Lecturer	The City College of New York	1/09/07 - 5/15/12

D. Honors and Awards

Non-tenure track (NTT) Career Development Grant for attending American Society of Microbiology (ASM) (Microbe 2020) Annual Conference in Chicago.

II. TEACHING & RESEARCH

A. Courses Taught:

(at Sam Houston State University: 2020-Present)

HLTH 2383	Multicultural Health Issues
HLTH 2391	Human Diseases

(at Indiana University Bloomington: 2014-2020)

Biot T415/T515	Theory and Application of Biotech Lab I
Biot T315	Biotechnology Laboratory
Biot T301	Biotechnology Seminar
Biol L104	Superbugs and Antibiotics

(at the City College of New York: 2007-2012)

CHEM32004	Biochemistry Laboratory
CHEM 26200	Organic Chemistry Lab 1

B. Graduate Theses/Dissertations, Honors Theses, or Exit Committees (if supervisor, please indicate):

(at Indiana University Bloomington)

Graduate Students

2019-2020	Co-supervision of graduate research student (Supervised by Dr. Karen Bush) Ting-Yu Chu on project titled "Antibiotic Susceptibility Testing and Sequence Typing for Carbapenem-Resistant Enterobacteriaceae (CRE) "
2019-2020	Co-supervision of graduate research student (Supervised by Dr. Karen Bush) Cameron Divoky on project titled "Determination of Mechanisms responsible for carbapenem resistance in Carbapenem-Resistant Enterobacteriaceae (CRE) Isolates by whole genome sequence analysis "
2019-2020	Co-supervision of graduate research student (Supervised by Dr. Karen Bush) Hillary Threath on project titled "Identification and characterization of β -lactamase genes in clinical isolates".
2018-2019	Co-supervision of graduate research student (Supervised by Dr. Karen Bush) Layla Irene Milton on project titled "Identification and characterization of β -lactamase genes in clinical isolates".
2018-2019	Co-supervision of graduate research student (Supervised by Dr. Karen Bush) Qingyu Tiffany Zhang on project titled "Identification and characterization of β -lactamase genes in clinical isolates".
2018-2019	Co-supervision of graduate research student (Supervised by Dr. Karen Bush) Miles Armijos on project titled "Characterizing Outer Membrane Proteins from Nosocomial <i>Serratia marcescens</i> Isolates with High Resistance to Imipenem "
2017-2018	Co-supervision of graduate research student (Supervised by Dr. Karen Bush) Alexander Campbell on project titled "Identification and characterization of β -lactamase genes in clinical isolates".
2017-2018	Co-supervision of graduate research student (Supervised by Dr. Karen Bush) Tiffany Fortney for the project titled" Characterization of β -lactamases in <i>Serratia marcescens</i> Isolates".
2016-2017	Co-supervision of two graduate research students (Supervised by Dr. Karen Bush) Jessica carpenter and Sharifah Altalhi for the project titled" Characterization of β -lactamases in <i>Serratia marcescens</i> Isolates".
2015-2016	Co-supervision of graduate research project (supervised by Dr. Karen Bush) for Ana Sheikh titled "Presence of SHV β -lactamase enzymes in <i>Klebsiella pneumoniae</i> (KP), <i>Escherichia coli</i> (E coli), and <i>Enterobacter cloacae</i> (ECL) isolates resistant to Carbapenem.

Undergraduate Students

2019-2020	Supervised research projects of an undergraduate student (Cristian Lee Hsiao) in various laboratory techniques, Gel electrophoresis, Western blot, protein expression in bacterial and mammalian cells. Maintaining
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mammalian cells.

- 2018-2020 Supervised research projects of an undergraduate student (Matthew kenkel) in various laboratory techniques, Gel electrophoresis, Western blot, protein expression in bacterial and mammalian cells. Maintaining mammalian cells.
- 2018- 2019 Trained undergraduate student Josh Kenkel in various laboratory techniques, Gel electrophoresis, Western blot, qPCR protein expression in bacterial and mammalian cells. Maintaining mammalian cells, virus amplification, plaque assay. Over expression and knockdown of mammalian genes. Also supervise the antibiotic resistance project where he characterized the presence of β -lactamase genes in clinical isolates.
- 2016 Supervised research projects of an undergraduate student (Jessica Carpenter) on knock down and over expression of mammalian protein in cell culture model. Also involved in the expression and purification of viral protein.
- 2016 Supervised undergraduate research project of Leila Alejandra C Cuervo. Research Project involved in the characterization of antibiotic resistance genes in clinical isolates. Also involved in the knock down and overexpression of gene in mammalian cells.
- 2016 Supervised research projects (as X498) of an undergraduate student Emil George for “ Molecular characterization of Antibiotic resistance In Clinical Isolates”.

C. Publications

- 1) Rahman M, **Sultana R**, Podder G, Faruque AS, Matthijssens J, Zaman K, Breiman RF, Sack DA, Van Ranst M, Azim T. 2005. Typing of human rotaviruses: nucleotide mismatches between the VP7 gene and primer are associated with genotyping failure. *Virology* 24:24.
- 2) Rahman M, **Sultana R**, Ahmed G, Nahar S, Hassan ZM, Saiada F, Podder G, Faruque AS, Siddique AK, Sack DA, Matthijssens J, Van Ranst M, Azim T. 2007. Prevalence of G2P[4] and G12P[6] rotavirus, Bangladesh. *Emerg Infect Dis*. 13(1):18-24.
- 3) Nillegoda NB, Theodoraki MA, Mandal AK, Mayo KJ, Ren HY, **Sultana R**, Wu K, Johnson J, Cyr DM, Caplan AJ. 2010. Ubr1 and Ubr2 function in a quality control pathway for degradation of unfolded cytosolic proteins. *Mol Biol Cell*. 21(13):2102-2116.
- 4) **Sultana R**, Theodoraki MA, Caplan AJ. 2011. UBR1 promotes protein kinase quality control and sensitizes cells to Hsp90 inhibition. *Exp Cell Res*. 318(1):53-60.
- 5) **Sultana R**, Theodoraki MA, Caplan AJ. 2013. Specificity in the actions of the UBR1 ubiquitin ligase in the degradation of nuclear receptors. *FEBS Open Bio*. 3:394-397.
- 6) Gray LR, **Sultana R**, Taylor EB et al. 2015. Hepatic Mitochondrial Pyruvate Carrier 1 Is Required for Efficient Regulation of Gluconeogenesis and Whole-Body Glucose Homeostasis. *Cell Metab*. 22(4):669-681.

- 7) Khan KM, Chakraborty R, Colon A, Upreti P, **Sultana R**, Toor D. Associations between handwashing behavior, hand bacterial count and infectious disease outcomes among low-income community children in New Delhi, India. *In-progress*.
- 8) Chakraborty R, Taylor S, Toor D, **Sultana R**, Bush K, Khan KM. Microbial contamination in drinking water, antimicrobial resistance, and diarrheal diseases in a low-income community in New Delhi, India. *In-progress*.
- 9) Denys GA, Carpenter J, Tulpule A, **Sultana R**, Magill N, Bush K, *et al*. Ten-year longitudinal assessment (2009-2018) of carbapenem resistant Enterobacteriaceae and resistance mechanisms from Indiana health care Centers. *In-progress*.
- 10) Zhang Q, Carpenter J, **Sultana R**, Bush K, *et al*. In vitro activity of cefiderocol against carbapenem nonsusceptible Enterobacteriaceae clinical isolates from central Indiana. *In-progress*.
- 11) Zhang Q, Chu T, Fortney T, Armijos M, **Sultana R**, Bush K, *et al*. Effects of imipenem and imipenem-relebactam on carbapenem-resistant *Serratia marcescens* producing KPC and SME serine carbapenemases. *In-progress*.
- 12) Chu T, Zhang Q, Tulpule A, **Sultana R**, Denys G, Bush K, *et al*. Epidemiology of metallo- β -lactamases in carbapenem-resistant Enterobacteriaceae (CRE) isolates from Indiana health care centers. *In-progress*.

D. Conference Presentations

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| 2020 | Qingyu Zhang, Ting-Yu Chu, Jessica Carpenter, Rasheda Sultana , Karen Bush <i>et al</i> . In vitro Activity of Cefiderocol Against Carbapenem nonsusceptible Enterobacteriales clinical isolates from central Indiana. Presentation at the American Society for Microbiology (ASM) 2020 Conference, Chicago, IL. June 2020 |
| 2020 | Ting-Yu Chu, Qingyu Zhang, Rasheda Sultana , Karen Bush <i>et al</i> . Epidemiology of Metallo- β -lactamase in Carbapenem-Resistant Enterobacteriaceae (CRE) Isolates Collected from Central Indiana Hospitals and Healthcare Centers. June 2020 |
| 2020 | Devinder Toor, Pooja Upreti, Karen Bush, Rasheda Sultana , Rishika Chakraborty, and Khalid Khan. Bacterial Contamination and Antibiotic Resistance in Water and Hand Samples Collected from Children in a Low Socioeconomic Setting in New Delhi, India. Presentation at the American Society for Microbiology (ASM) 2020 Conference, Chicago, IL. June 2020 |
| 2019 | Taylor Truex, Layla Milton, Tiffany Fortney, Qingyu Zhang, Rasheda Sultana , Karen Bush, "Effects of imipenem and imipenem-relebactam on carbapenem-resistant <i>Serratia marcescens</i> producing KPC and SME serine carbapenemases" Poster presented for 2019 ASM Microbe meeting in San Francisco, California. June 2019 |
| 2019 | Qingyu Zhang, Anagha Tupule, Rasheda Sultana , Karen Bush, "Apparent Loss of Metallo- β -lactamase Genes in Carbapenem-resistant <i>Enterobacteriaceae</i> Due to Culture Heterogeneity" Poster presented for 2019 ASM Microbe meeting in San Francisco, California. June 2019 |

- 2019 Taylor Truex, **Rasheda Sultana**, and Karen Bush
 “Effects of imipenem on carbapenem-resistant *Serratia marcescens* producing serine carbapenemases” for 2019 Poster presented in The annual Hutton Honors College Research Symposium and poster fair, Education Building, Indiana University, Bloomington, IN. April 2019
- 2019 Layla Milton, **Rasheda Sultana**, and Karen Bush
 “Characterization of carbapenem-resistant *Serratia marcescens* clinical isolates” for 2019 Poster presented in The annual Hutton Honors College Research Symposium and poster fair, Education Building, Indiana University, Bloomington, IN. April 2019
- 2019 Qingyu Zhang, **Rasheda Sultana**, and Karen Bush “Apparent loss of metallo- β -lactamase genes in carbapenem-resistant Enterobacteriaceae due to culture heterogeneity” for 2019 Poster presented in The annual Hutton Honors College Research Symposium and poster fair, Education Building, Indiana University, Bloomington, IN. April 2019
- 2018 Rishika Chakraborty, Janesh Karnati, **Rasheda Sultana**, Anne Pyburn, Karen Bush, Khalid Khan *et al.* “Design of a prospective epidemiological study on a handwashing and safe water intervention in a low-income community in urban New Delhi, India, presented in Indiana CTSI Annual Meeting at IUPUI campus in Indianapolis. September 2018
- 2018 Tiffany Fortney, Yunliang Zhang, Alex Campbell, Jessica Carpenter, **Rasheda Sultana**, Karen Bush. “Microbiological Response of *Serratia marcescens* Isolates to β -Lactamase Inhibitor Combinations in the Presence of KPC and SME Carbapenemases” Poster presented for 2018 ASM Microbe meeting in Atlanta, Georgia. June 2018
- 2018 Alex Campbell, Jessica Carpenter, **Rasheda Sultana**, and Karen Bush
 “Molecular and Genetic Characterization of Carbapenemase-Producing *Enterobacteriaceae* from 2016-2017” for 2018 Poster presented in The annual Hutton Honors College Research Symposium and poster fair, Education Building, Indiana University, Bloomington, IN. April 2018
- 2018 Nick Neidig, Taylor Truex, **Rasheda Sultana**, and Karen Bush
 “Investigation of Colistin Resistance in Carbapenem-Resistant *Enterobacteriaceae* (CRE) Clinical Isolates from Central Indiana Health Care Centers” for 2018 Poster presented in The annual Hutton Honors College Research Symposium and poster fair, Education Building, Indiana University, Bloomington, IN. April 2018
- 2018 Sharifah Altalhi, **Rasheda Sultana** and Karen Bush
 “Fitness Comparison between KPC-2 and KPC-3-producing *Klebsiella pneumoniae* in Indiana Clinical Isolates” for 2018 Poster presented in The annual Hutton Honors College Research Symposium and poster fair, Education Building, Indiana University, Bloomington, IN. April 2018
- 2018 Tiffany Fortney, **Rasheda Sultana** and Karen Bush
 “Molecular Characterization and Antibiotic Resistance Profiles of *Serratia marcescens* Clinical Isolates Harboring KPC-3 or SME Carbapenemases” for 2018 Poster presented in The annual Hutton Honors College Research Symposium and poster fair, Education Building, Indiana University, Bloomington, IN. April 2018

- 2018 Tiffany Fortney, Yunliang Zhang, Alex Campbell, Jessica Carpenter, **Rasheda Sultana**, Karen Bush. "Microbiological Response of *Serratia marcescens* Isolates to β -Lactamase Inhibitor Combinations in the Presence of KPC and SME Carbapenemases" for 2018 ASM Microbe meeting in Atlanta, Georgia. January 2018.
- 2017 Karen Bush, Yunliang Zhang, Anagha Tulpule, **Rasheda Sultana** and Gerald Denys abstract submitted on "Carbapenem Resistance in the Central United States" in IC2AR meeting in Costa Da Caparica (Lisbon) Portugal. June 2017
- 2017 Sharifah Altalhi, Karen Bush and **Rasheda Sultana**. "Phenotypic and Molecular Identification of β -lactamases in Clinical Isolates" Poster presented in The annual Hutton Honors College Research Symposium and poster fair, Education Building, Indiana University, Bloomington, IN. April 2017
- 2017 Jessica Carpenter, **Rasheda Sultana** and Karen Bush. "Identification and Characterization of Carbapenemase-Producing *Enterobacteriaceae* from 2014-2016" Poster presented in The annual Hutton Honors College Research Symposium and poster fair, Education Building, Indiana University, Bloomington, IN. April 2017
- 2016 Ana Sheikh, Karen Bush and **Rasheda Sultana**. "SHV β -lactamase presence in *Klebsiella pneumoniae* (KP), *Escherichia coli* (E coli), and *Enterobacter cloacae* (ECL) isolates resistant to carbapenems" Poster presented in Annual IUB Undergraduate Research Symposium and poster fair, Education Building, Indiana University, Bloomington, IN. April 2016
- 2011 **Rasheda Sultana**, MA Theodoraki, and AJ Caplan. Mammalian Ubiquitin Ligase Promotes Cellular Sensitivity to an Hsp90 Inhibitor. Poster and abstract presented in CCNY-MSKCC Partnership for Cancer Research, Training and Community Outreach (June 10, 2011) at New York Academy of Medicine, New York. June 2011
- 2011 **Rasheda Sultana**, MA Theodoraki, and AJ Caplan. Mammalian UBR1 Ubiquitin Ligase Promotes Cellular Sensitivity to an Hsp90 Inhibitor. Poster and Abstract presented in 16th Annual Midwest Stress Response and Molecular Chaperone Meeting (January 15, 2011) at Northwestern University, Evanston, Illinois. January 2011
- 2010 **Rasheda Sultana**, NB Nillegoda, Atin Mandal, Maria Theodoraki, and AJ Caplan. Mammalian UBR1 and UBR2 Ubiquitin Ligases Promote Degradation of HSP90 Clients. Poster and Abstract presented in Molecular Chaperones and Stress Responses (May 4-8, 2010) at Cold Spring Harbor Laboratory, Cold Spring Harbor, New York. May 2010
- 2009 **Rasheda Sultana**, Nadinath B. Nillegoda, Atin Mandal, Maria Theodoraki, Neal Rosen and AJ Caplan. Conserved function of mammalian Ubiquitin ligases UBR1 and UBR2 in degradation of Hsp90 client protein kinases. Poster and abstract presented in CCNY-MSKCC Partnership for Cancer Research, Training and Community Outreach (June 10, 2009) at the Graduate Center, City University of New York, New York. June 2009

E. Funded Grants

1. IU President's International Research Award (PIRA)

05/01/18-04/30/21

*Total Amount: \$100,000***Role: Co-Investigator (Co-I)**

The goal of the study is to develop an elementary school-based intervention to promote handwashing and safe water behavior among low-income children and their families in New Delhi, India. Additionally, the project characterizes antibiotic resistance properties of bacteria commonly associated with drinking water and hand contamination in low-income communities.

Role: Co-Investigator (Co-I)

III. SERVICE (at Indiana University Bloomington, 2014-2020)**UNIVERSITY AND DEPARTMENTAL SERVICES**

1. Served as a Judge for evaluating the research presentations competition; Event organized by Indiana Junior Academy of Science. 2016-2017
2. Conducted lecture and demonstration sessions in the Biotechnology outreach program that trained high school teachers on Biotechnology techniques. 2015
3. Interviewed seven international students (via Skype) who applied to join the Biotechnology MS program. 2015

PROFESSIONAL DEVELOPMENT ACTIVITIES

March 2016

1. Workshop on the use of Flow Cytometry in research projects. 2016
2. Attended three professional development workshop/training on the use of Canvas for course management. Workshop was offered by the Center for Innovative Teaching and Learning (CITL) at IU-Bloomington. 2015
3. Laboratory Biosafety Training at IU-Bloomington. 2015