

FRESHMAN RESEARCH IMMERSION POSTER SESSION



November 28, 2018

BINGHAMTON
UNIVERSITY
STATE UNIVERSITY OF NEW YORK

FRESHMAN RESEARCH IMMERSION

Freshman Research Immersion (FRI) is a three-course sequence of CUREs (course-based undergraduate research experience) in STEM disciplines which provides first-year students with an authentic research experience. Working alongside faculty and fellow students on cutting-edge research projects, participants tackle weighty world issues, build powerful relationships, and set a course for college and career success.

Currently, FRI has ten research streams with six in life sciences and four additional streams in physical science and engineering disciplines. Each stream has a team of 3-5 faculty sponsors, a research educator, undergraduate peer mentors, and a dedicated laboratory space with research grade equipment.



The first semester research methods course has the following key elements: introduction to process of identifying interesting problems; reading scientific literature to determine what is known and unknown; analyzing data; reporting findings using professional standards of communication; working collaboratively.

In the second semester course, students delve into the research theme of their stream and learn how to use the equipment and protocols of that research stream, such that they write a research proposal and begin a research project.

In the third semester course, students continue their research project and complete the program with a research report and poster.

After FRI, a significant portion of students have continued as FRI undergraduate peer mentors. Also, many of students have continued research with faculty. To date, student teams have presented their research at regional, national, and international conferences and in peer-reviewed publications.

BIOGEOCHEMISTRY

Jonathan Schmitkons, PhD, Research Educator

Graduate TA: Franco Braiotta

Faculty: Joseph Graney, Thomas Kulp, Tim Lowenstein, Weixing Zhu

Sophomore Researchers

1. Compositional analysis of Green Lake bioherms

Brittany Brems, Ryan Cohen, Gabrielle Grillo, Sajid Kabir, Jake McCarthy, Zachary Walker

2. Determining the effectiveness of lichens as environmental monitors

Alex Blumenthal, Sophie Cohen, Matthew Harrison, Raina Searle, William Smisko

3. Hydrochemical analysis and closed system modeling of Glacier Lake for the verification of *meromixis*

Elize Chaves, Seth Price, Jenna Ross

4. Oxidation of sulfur, arsenic, and antimony by purple sulfur bacteria

Gabriel Bongiorno, Andrew Kennedy, Jonathan Tuvy

5. The effects of deicers on denitrification rates

Margaret Kimmel, Xiaoxin Liang, Anmei Rupnick

Freshman Researchers

4:30-5:30pm

6. Determining the environmental conditions of the Gilboa Forest: the earliest example of a forest ecosystem in the fossil record

Ailish Goering, Charlotte Heo, Morgan Immoor, Sarah MacEntee, Rachel Verdi

7. Effects of excess salt on plant pollution filtration in constructed wetlands

Jaymin Bhatt, Julia Coffey, Benjamin McDonald, John Mignone, Anesha Morrison

8. Exploring how purple and green sulfur bacteria respiration from a meromictic lake may affect arsenics and antimony toxicity

Brandon Bessen, Vicllie Chueng, Kaitlyn Cottrell, Kevin Niola, Marie Taylor, Kathleen Van Nostrand

5:30-6:30pm

6. Effects of salinity and pH on microbial respiration of arsenic and antimony in urban wetlands

Catherine Bibby, Katie Chen, Sofia Fasullo, Jessica Knapp, Tara Lerman, Emily Twerie

7. Whiting events: biological, geological, or both?

Jack Flanagan, Kathryn Graham, James Hastings, Elizabeth Intskirveli, Grace Laney, Jason Lumerman

BIOMEDICAL CHEMISTRY

Susan Flynn, PhD, Research Educator

Faculty: Susan Bane, Brian Callahan, Christof Grewer, Wei Qiang

Independent Study Researchers

9. Glu-glow: creating a fluorescent protein reporter panel of glutamate transporters

Nina Pregosin

10. Monitoring the effects of post-translational modifications on amyloid-beta peptide aggregation

Joseph Mauro, Tyler Spohr

Sophomore Researchers

11. EAAT2 and EAAT3 response to the β -lactam antibiotics: Ceftriaxone and Amoxicillin

Nicholas Catalano, Christopher Coble,

Megan Fey, Nicole Kopetz, Sarah Kromer,

Devin Pang, Daniel Powell, Hunter Shaw

12. Investigating oxidative stress in the Bcl-2 pathway of A549 cells in the presence of Taxol and Colchicine

Jessica Barnard, Tashawna Harris, Alyssa

Leung, James Oldham, Peter Prisinzano,

Caitlin Vitro

13. Monitoring lung carcinoma cellular response to artificial sweeteners

Anna Brennan, Brandon Ngo, Harit

Ruengsomboon, Kat Sanders

14. Monitoring oxidative stress in the presence of a HDACi chemotherapy drug in A549 cells

Annalisa Ferrotta, Alejo Gomez, Jaclyn Jew,

Emily Loiaconi, Hannah Malter, Deepa

Mistry, Karen Nganjyineza

15. Optimization of monitoring glutamate transport and investigating the third sodium coordination site in the GLT-1 transporter

Lamorna Coyle, Charlene Dong, Eden Hirsch, Samuel Santos, Liam Shanley

Freshman Researchers

4:30-5:30pm

16. DAPT's effect on amyloid-beta secretion in Alzheimer's disease

Paige Bzdyk, Joseph Hayes, Emily

Mohlmann, Arpeet Patel, Alexandra Stone,

Jillian Vargas

17. JPH203's effect on LAT1's leucine uptake in thymic carcinoma and BTC

Felix Aung, Alexa Avallone, Sara Baldwin,

Noah Beck, Angelina Bonacasa, Grace

Malley

18. miRNA-192 and miRNA-194 expression in cells lines A549 and H1703

Charlotte Brosoff, Zarmina Chaudhry, Daniel

DiBua, Quintin Evans, Tiffany Francois, Maya

Goldman, Jacob Scarcella

5:30-6:30pm

8. Examining the inhibition of mGluR1 in the presence of Riluzole and BAY36-7620 in glioblastomas

Bryce Heller, Gianna Mochi, Muraad

Mughal, Christina Musco, Sonia Nelson,

Sharon Yun

16. Variants of amyloid beta differentially locate and affect cell viability

Katie Heit, Bridget Kennedy, Caitlin Lallier,

Sarah Mack, Colin Matthews, John

McDonald

COMMUNITY & GLOBAL PUBLIC HEALTH

Jodi Dowthwaite, PhD, Research Educator

Faculty: Gary James, Yvonne Johnston, Titilayo Okoror

Sophomore Researchers

19. Caffeine and sugar-sweetened beverage consumption and mental health in college students

Nashwan Chowdhury, Catherine Cursio, Lauren Levine, Hannah White

20. Comparison of techniques for estimation of peak height velocity

Jennifer Minassian, Matthew Pelowski

21. Dietary patterns as a factor in rates of growth and maturation in adolescent females

Hebba Ahmad, Katie Carbajal, Jennifer Minassian, Trinh Nguyen, Brionna Palmerino

22. Socioeconomic and musculoskeletal correlates of hormonal contraceptive Use

Dana Al Kuisi, Mahmoud Almady, Jacqueline Pina, Berkley Sawester, Agnes Sydenstricker

23. Variation of body composition and bone properties around peak height velocity

Maia Boni, Michael Carpenter, Fatima Imdad, Laura Koszer, Matthew Pelowski

Freshmen Researchers

4:30-5:30pm

24. Parental socioeconomic indicators and child obesity

Christina Langan, Ryan Noel, Thomas Raleigh, Christopher Rush, Shravani Vanapalli

25. The effectiveness of psilocybin as a treatment for treatment-resistant depression

Gabrielle Blume, Kristen Carrano, Miranda Cesped, Alexandria Colon, Zayn-Al-Din Harper, Aaron Jed, Sonali Malhotra

26. The effects of exercise on the symptoms of post-traumatic stress disorder

Gabrielle Diana, Lauren Fogel, Thomas McKiernan, Lauren Metzdorff, John Pennisi, Claire Rein, Leah Solomon

5:30-6:30pm

17. Plant-based diets as a factor in anxiety and depression

Ripley Hoffman, Devin Link, Alexa Schwartz, Sydney Silverman, Daisy Villalva, Celia Walden

18. Vitamin D and calcium as factors in bone health: an international perspective

Laura Adams, Luke Aghanenu, Leilani Aviles, Elizabeth Bekerman, Chloe Blumberg, Simran Dhanda, William Held

ECOLOGICAL GENETICS

Lua Lopez Perez PhD, Research Educator

Faculty: Jessica Hua, Matthew Parker, Thomas Powell, Kristen Prior, James Sobel

Freshman Researchers

4:30-5:30pm

27. Phenotypic changes over increasing altitude in *Arabidopsis thaliana* along its non-native range

Andrew Curreri, Brian Lubimov, Alexandra Manos, Caitlyn Roig, Abigail Vidrin, Maxine Zaretsky

28. The effect of CO₂ and drought on stomatal surface on an endangered endemism

Eric Cheng, Erin Kelly, Melinda Lee, Abigail Long, Kelly Pagniello, Armand Perez

29. Variation in cold tolerance across latitudinal gradient of *Mimulus ringens* (monkey flower)

Isabella Cavallo, Ariel Friedman, Sarah Liebowitz, Diana Riestra, Stacy Safari, Paul Sekas

5:30-6:30pm

24. Adaptation through gene loss in *Arabidopsis thaliana*

Jessica Melita, Elizabeth Oswald, Amanda Pizzo, Alisha Salbert

25. The effects of light pollution on the behavior and development of frogs

Kelsey Horn, Angelika Lyko, Connor Lynch, Elizabeth Pulley, Elizabeth Schwoerer, David Timmerman

ENVIRONMENTAL VISUALIZATION

Timothy de Smet, PhD, Research Educator

Graduate TA: James Bourke

Faculty: Carl Lipo, Alex Nikulin, Jeffrey Pietras, Matthew Sanger

Sophomore Researchers

30. A statistical approach to modeling induced seismicity in Oklahoma using multiple linear regression

Nicole Anichich, Marjani Brown, Janine Hvizdos, Gwendolyn Lee, Jialin Li, Miranda Owen

31. Comparison of remote sensing techniques in the search for unmarked buried bodies

Jack Horvath, Joshua Mediavilla, Jessica Moran, Kiara Pena-Augusto, Katrina Weiner, Jacob Wilcox

32. Deploying a UAV-based system to identify methane-emitting oil and gas wells
Judy Li, Ethan Penner, Kevin Reilly, Natalia Romanzo, Samantha Wong

33. Remote sensing and world systems theory at Queen Esthers Site

Jason Russo, Marina Stern, Jillian Vinci, Jennifer Waterman, Linda Zheng

34. Using remote sensing to detect tree distress due to Woolly Adelgid infestation
Stacey Bayer, Victoria Boos, Nefia Chacko, Laquan Garvey, Adin Witt

Freshman Researchers

4:30-5:30pm

35. Detecting Stress in the eastern hemlock by the Woolly Adelgid

Hannah Fishbein, Kathryn Gauthier, Thomas Grosso, Kelly Lebohner, Jeremy Samson, Benjamin Weintraub

36. Predictive modeling of disease-carrying tick density using drone based imagery

Jared Green, Abigail Lilly, Rebecca Marcus, Joseph Murray, Mikayla Scarabelli

37. The use of hyperspectral remote Sensing in the detection, monitoring, and prediction of harmful algal blooms

Hudson Hyams, Keeley Nguyen, Jason Provanzano, Mary Williams, Kelly Young

5:30-6:30pm

28. The detection of unexploded BM-21 Grad 122 mm missiles

Kaylee Cappuccio, Gabriel Chen, Amy Havill, Harry Janoff, Adam Khan, Issac Spiegel

29. Using modern technology to detect and prevent genocide and mass atrocities

Anthony Georgiou, Codyann Henry, Sri Drishaal Kumar, Jakeb Specht, Sydney Trilling, Sophie Whiteman

IMAGE & ACOUSTIC SIGNALS ANALYSIS

Mehdi Ghayoumi, PhD, Research Educator
Faculty: Kenneth Chiu, Scott Craver, Lijun Yin

Sophomore Researchers

38. Extracting and applying gaze data for gaze pattern identification

Jacob Aaronson, Christopher Banvard, Jack Casey, Jake Cope, Miguel Gomez, Andrew Perlowin

39. Holistic identification of scene text with a general image classification CNN

John Curtin, Alison Garrity, Theresa Gundel, Narindra Persaud

40. Sorting recyclable waste to prevent contamination using a convolutional neural network

Kate Baumstein, Paul DeCostanza, Josef Goldberg, Larkin Wisdom

Freshman Researchers

5:30-6:30pm

26. Effect of gaze pattern based stimuli on Alzheimer's patients

Erin Connolly, Adiel Felsen, Seth Rosenblatt, Reece Pena, Richard Quinlivan, Spiros Rally, Sophie Saremsky

27. Patient-robot interaction through affective analysis using a CNN

Charles Bartoletti, Dominic Dudek, Telly Heidl, Amie Laye, Benjamin Preiser, Joanna Radoslovich

35. Targeted lip reading for security purposes using a CNN

Jack Albertson, Dede Bavon, John DePetro, Naman Garg, Katherine Rollins, Isaiah Farrell

36. The effects of cosmetics on the accuracy of deep learning pixel-based facial-recognition algorithms

Victoria Haimov, Jared Kaufman, Brendan Klayman, Nicholas Pellegrino, Jennifer Thakkar

37. Using convolutional neural networks to detect false emotions

Daniel Iacobacci, Claire Iriarte, Joseph Irish, Brandon Machado, Ryan Ogi, Nathan Shanley

MICROBIAL BIOFILMS IN HUMAN HEALTH

Caitlin Light, PhD, Research Educator

Graduate student collaborator: Catalina Florez

Faculty: David Davies, Claudia Marques, Karin Sauer, Jeffrey Schertzer

Sophomore Researchers

44. Development of a novel quantification method for cyclic-di-GMP using bis(p-nitrophenyl) phosphate

Kristina Bell, Christopher Farrell, John Fauvell, Brianna Mendelson

45. Development of a novel quantification method for cyclic-di-GMP using cMANT

Talia Cheifetz, Steven Coyle, Golda Eichen, Zachery Goess, Mio Ito

46. Pseudomonas quinolone signal quantification during *Pseudomonas aeruginosa* biofilm development

Angus Johnson, Avery Lieber, Aysha Malawaraarachchi, Michelle Terry, Chase Tomasino

47. Quantifying outer membrane Vesicles during *Pseudomonas aeruginosa* biofilm development

Shannon Daino, Kristen Eichele, Lindsay Mendelson, Christopher Ranalli, Matthew Roos, Antonio Torlentino

48. Role of the type VI secretion system on virulence and pathogenesis in biofilm dispersion

Rebecca Aitken, Chun Ting Kao, Kayla Mastropietro, Joseph Migliano, Jake Schweitzer, Nigel Viegas

Freshman Researchers

4:30-5:30pm

41. Biofilm treatment in recreational water systems

Danielle Dattler, Sonia Hills, Nicholas Morales, Sonali Patel, Abigail Gui Radin, Alexander Robins, Ariel Sherry

42. Effectively treating *Pseudomonas aeruginosa* biofilms in burn wounds

Stephen Baio, Sean Decker, Courtney Fu, Julia Horowitz, Jacob Shepard, Loir Zweig

48. Elimination of biofilms in the food industry: a two-step approach

Allison Cisco, Anthony D'Angio, Sara Evans, Jared Grant, Giselle Jimenez, Ashley Kim

5:30-6:30pm

41. Effects of different treatment methods for biofilms on toothbrushes

Julia Diana, Mark Melnik, Nolan Miller, Jannatul Naima, Emily Rail, Ewa Sulicz

42. Oil spill remediation using bacterial biofilms

Caiya DeVerna Schuster, Elijah Gordon, Justin Grunthal, Elizabeth Lai, Nicole Remes, Jordan Thesier

MOLECULAR & BIOMEDICAL ANTHROPOLOGY

Michel Shamon-Pour, PhD, Research Educator

Graduate TA: Kyle Gowen

Faculty: Ralph Garruto, J. Koji Lum, D. Andrew Merriwether

Sophomore Researchers

49. Human mitochondrial genetic diversity

In western Iran

*Bhavreet Dhandi, Vishnu Nair, Dylan
Nicholson, Victoria Sallows, Maria Sosa*

**50. Origins and dispersal of *Ixodes
scapularis*, the tick vector of the Lyme
disease in the Southern Tier region: a
mitochondrial DNA perspective**

*Justin Ames, Lindsay Blank, Anthony
Germano, Jessica Kellam, Alivia Ruiz*

**51. OspC typing of *Borrelia burgdorferi*, the
Lyme disease bacteria, in the tick
populations of the Southern Tier region**

*Palmer Ernst, Christine Hurley, Ariel
Makower, Neha Shaikh, Julia Tran, Tingyao
Wang*

**52. Population genetics of southern
Anatolia according to mitochondrial DNA**

*Catherine Ayiku Chinock, Amelia Chuisano,
Kai Higuchi, Nicole Martini, Alex Montoya,
Ethan Spielvogel*

**53. Prevalence of prion protein gene
variants among Kuru affected populations
of Papua New Guinea**

*Nia Brown-Fonrose, Shannon Erickson, Julia
Giacinto, Jared Nasso, Dillon Oswald,
Anastassia Shifchik*

Freshman Researchers

4:30-5:30pm

**54. Exploring the associations between
clinically-important mitochondrial DNA
mutations and haplogroups**

*Rotem Alon, Ryan Casey, Olivia
Charytonowicz, Tia Gross, Humza Khan,
Kayla Lieb*

**55. Impact of global warming on the spread
of black legged ticks and Lyme disease in
northeastern United States**

*Brittney Krasnov, Gina Magardino, Thomas
Relyea, Erin Urban, Mary Williams, Mike
Valarezo*

**56. Persistence mechanisms of *Borrelia
Burgdorferi* and post treatment Lyme
disease syndrome**

*Vanessa Fazzini, Akiva Grimaldi, Abha Japi,
Olivia Klingbeil, Jesse Martinez, Allison
Wlazlo*

5:30-6:30pm

**48. The origin and dispersal of the Y-
chromosome haplogroup R1b-V88**

*Osariemen Aiyebomwan, Riley Balthazor,
Megan Egan, Sarah Gnage, Nicole
Harrington*

**54. UV radiation and evolution of human
mitochondria**

*Thomas Grande, Kevin Langbart, Klairé
Martinez, Julia Metz, Danielle Napoli, Lauren
Picone, Skyler Powers*

NEUROSCIENCE

Deborah Kreiss, PhD, Research Educator

Graduate TA: Kathryn Lanza

Faculty: Christopher Bishop, Terrence Deak, Lisa Savage

Sophomore Researchers

57. Analysis of anti-choline acetyltransferase saporin as a viable model for Alzheimer's disease and its effects on movement

Jason Howard, Katelyn Lerner, Ryan McGuire, John Russo, Lea Safarpour, Alice Zhang

58. Analysis of neurotransmitter preservation through heat inactivation of enzymes

Rosemary Cannarella, Cristal Finkenber, Zachary Herz, Madison Kleppan-Mella, Benjamin Morrison, Jessica Smith

59. Effects of anti ChAT saporin lesions on spatial memory and ACh levels in the hippocampus

Aissata Diallo, Jovannah Gerisma, Jacob Harron

60. Effects of isoflurane on monoamines in the corpus striatum of male and female rats

Simra Aziz, Linie Li, Lauren Misata, Hannah Rockwood

61. Effects of varying isoflurane anesthesia levels on serotonin and dopamine levels in the rat motor circuit

Allison Goetz, Joseph Lepore, Lily Rundquist, Caiti-Erin Talty, Sihan Zeng

62. The effect of sodium pentobarbital and isoflurane on acetylcholine concentration in the pedunculo pontine tegmental nucleus, striatum, and substantia nigra

Mia Cruceta, Carolyn Fon, Elizabeth Kilpatrick, Andrea Liss, Noelle Marcotullio

Freshman Researchers

4:30-5:30pm

63. Comparison of rat behaviors that model Obsessive-Compulsive Disorder

Erika Hryhorenko, Julia Mende, Abigail Reilly, Gina Rizzo, Sydney Tse, Sophia Valerino, Hannah Wojcik

64. Evaluation of targets for deep brain stimulation in a rat model of Obsessive-Compulsive Disorder (OCD)

Kristen Coletti, Juan Mato, Benjamin Moses, Rebecca Nussbaum, Dana Silberstein, Maylin Vititow

5:30-6:30pm

55. Effect of hormonal cycles on obsessive compulsive behaviors in a rat model

Hana Makota, Lenah Midani, Samantha Paley, Allison Radin, Eliana Safer, Emily Walters

56. Manipulation of the subthalamic nucleus to reduce Obsessive Compulsive Disorder in a rat model: deep brain stimulation versus localized drug injection

Randy Abramovich, Randy De La Cruz, Nicole Gill, Olivia Lawrence, Alyssa Quaglia, Juliana Viola

63. Use of a rat model to investigate ketamine as an alternative pharmacological treatment of Obsessive Compulsive Disorder

Emily Bellow, Brooke Bokal, Miya Carmichael, Kayla Elder, Jessica Krupa, Danielle Stern

SMART ENERGY

Liliana Karam, PhD, Research Educator

Faculty: Tara Dhakal, Nikolay Dimitrov, Manuel Smeu, Bruce White,
Stan Whittingham

Freshman Researchers

4:30-5:30pm

65. Carbon quantum dots as environmental sensors of paraoxon

Davis Gee, Carrie Hathaway, Ivy Li, Deiniol McGovern, Zachary Szigeti, Samin Zaman

66. Comparing synthetic methods of quantum dot fabrication for reducing environmental impact

Adam Burbank, Kristine Denimarck, Ian Joel Fernandez, Kevin Phillips, Lorenzo Schellack, Ryan Schieber

5:30-6:30pm

64. Comparing power conversion efficiencies of cadmium-based quantum dots in thin film solar cells

Trevor Cronin, Joel Faynshmidt, Jonathan Pasternak, Alex Santana, Justin Snyder

65. Effects of doping on the efficiency of methylammonium lead halide perovskite solar cells

Daniel Coladangelo, Brian He, Anthony Pacileo, Aidan Sisk, Jeremy Wells, Oscar Young

66. Improving stability and efficiency of perovskite solar cells through layering

Ryan Board, Jamie Coghlan, Madeline Harp, Thomas Houghton, Christina Jacob, Brandon Liu

Funding for Freshman Research Immersion provided by:

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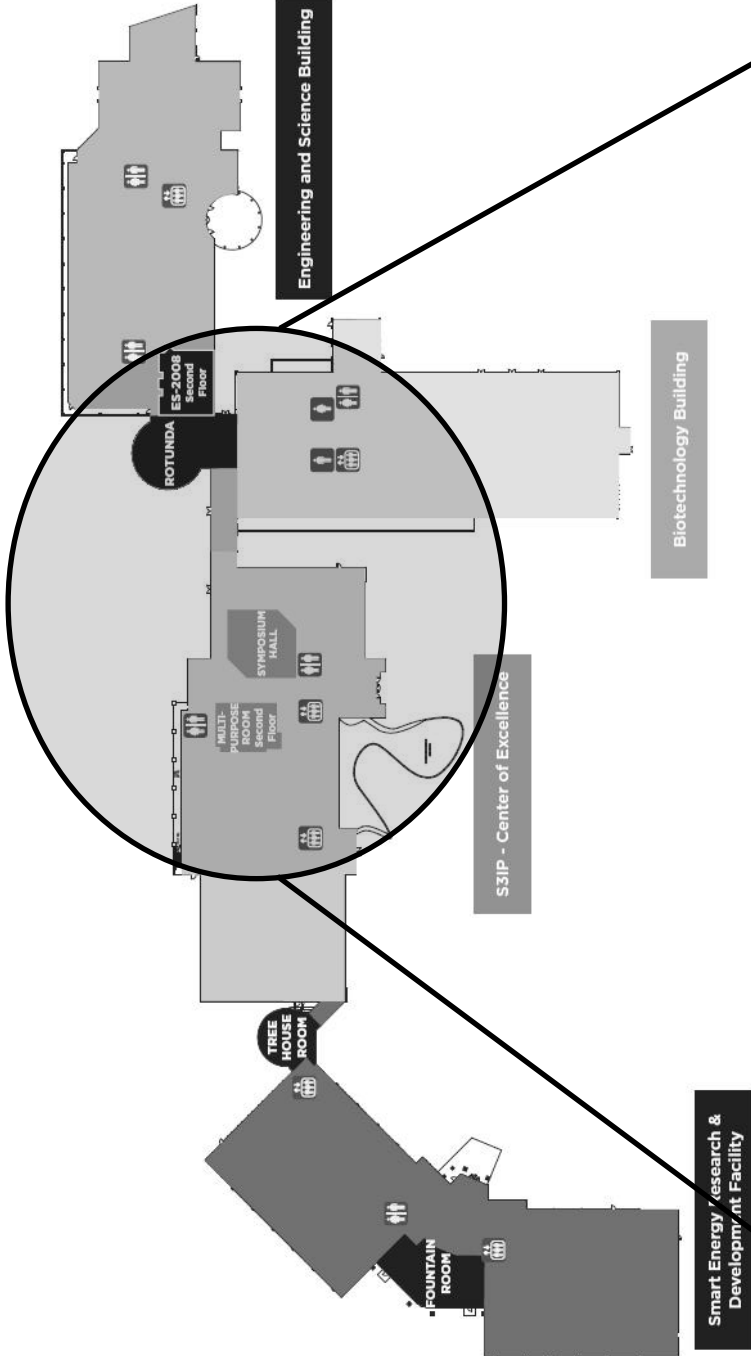
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of New York



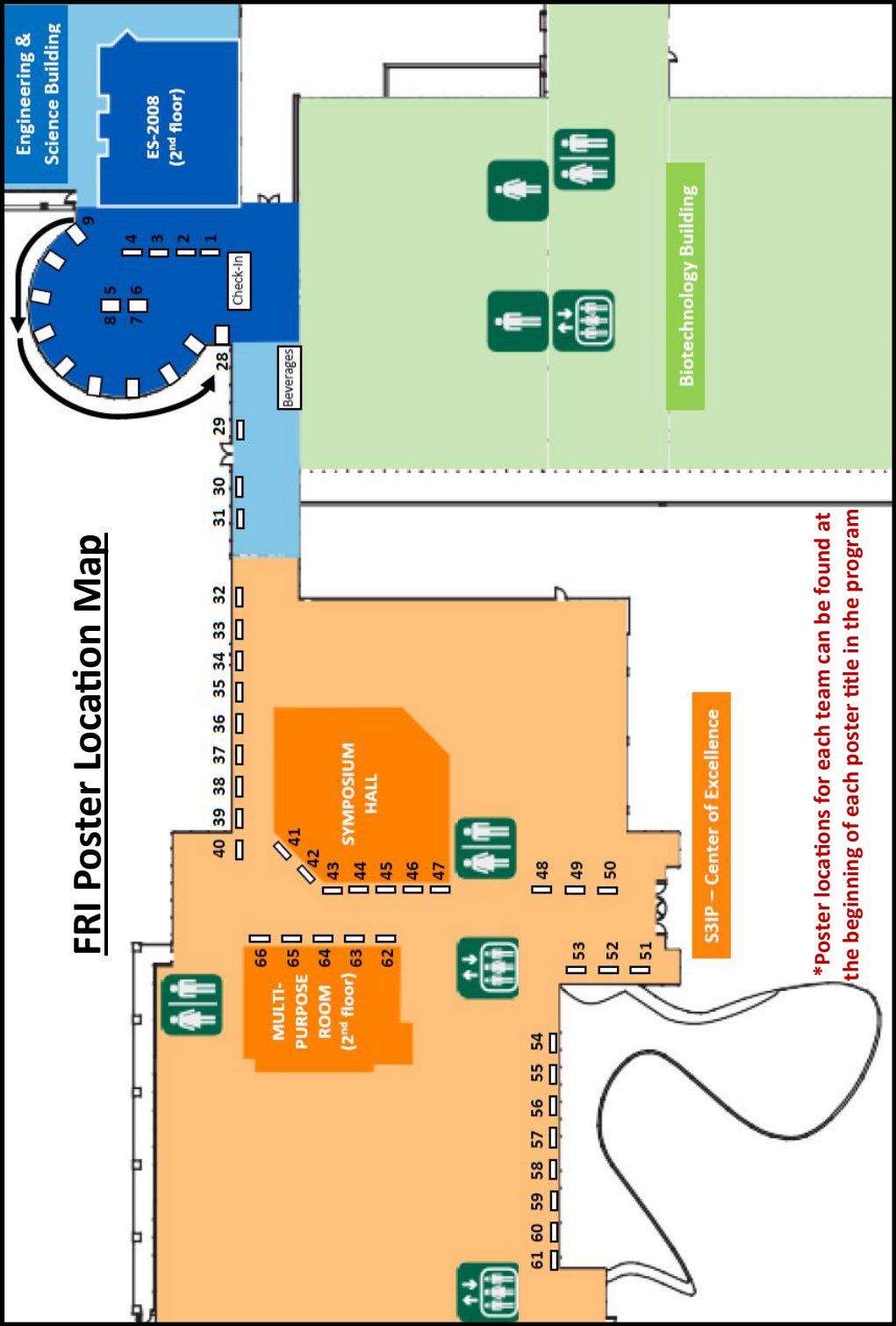
**Empire State
Development**

BINGHAMTON UNIVERSITY

INNOVATIVE TECHNOLOGIES COMPLEX



FRI Poster Location Map



***Poster locations for each team can be found at the beginning of each poster title in the program**



FRI Program Staff

Megan Fegley

Program Director

Nancy Stamp

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FRESHMAN RESEARCH IMMERSION PROGRAM

*Walk in a freshman —
Walk out a researcher.*