

# Jon Albo

BIOMEDICAL ENGINEER · MOLECULAR SCIENTIST

Ithaca, New York

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## Summary

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Biomedical focused engineer with experience solving problems in fast-paced technologically advanced environments. Graduate focus on development and use of high-throughput liquid handling devices to enable applications difficult or impossible to perform with traditional pipetting to improve animal and human health. Previous work in the design and development of multidisciplinary molecular approaches to analyze and solve a variety of biological systems through innovation.

## Education

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### Ph.D. Student in Biomedical Engineering

Ithaca, NY

CORNELL UNIVERSITY

May 2025

- NSF Graduate Research Fellow
- Cornell Graduate School IMSD Fellow and Dean's Scholar
- Cornell Sloan UCEM Affiliate

### B.S. in Chemical Engineering (Cum Laude)

Tallahassee, FL

FLORIDA STATE UNIVERSITY

May 2020

- Cummings Scientific Scholarship for Chemical and Biomedical Engineering
- Garnet and Gold Scholar

## Fellowships

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**2020-2025** National Science Foundation (NSF) Graduate Research Fellow

**2020-2025** Cornell Graduate School Dean's Scholar

Ithaca, NY

**2020-2025** Cornell Sloan University Center of Exemplary Mentoring (UCEM) Affiliate

Ithaca, NY

**2020-2025** One of three students across seven departments selected for the Cornell Graduate School Initiative for Maximizing Student Development (IMSD) Fellowship

Ithaca, NY

## Experience

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### Cira Laboratory, Cornell University

Ithaca, NY

GRADUATE RESEARCH ASSISTANT: DEPARTMENT OF BIOMEDICAL ENGINEERING

Aug. 2020 - Present

- Design, build, and characterize high-throughput liquid handling devices for advanced combinatorial assays
- Develop cutting edge biological assays for exploring areas in diseases that have traditionally been understudied
- Streamline development of high-throughput microfluidic liquid handling devices for range of multidisciplinary applications and scale-up

### Li Laboratory, Florida State University

Tallahassee, FL

STEM CELL RESEARCH ASSISTANT: DEPARTMENT OF CHEMICAL AND BIOMEDICAL ENGINEERING

Aug. 2019 - May 2020

- Facilitated differentiation of several human iPSC cell lines into brain-specific pericytes for future use in an *in vitro* blood-brain barrier model
- Characterized properties of pericytes and validated through comparison to brain-specific astrocyte and endothelial cells
- Investigated and implement improvements for multiple differentiation protocols based on new findings in literature

### Puig Laboratory, US Department of Agriculture - Agricultural Research Service

Miami, FL

PLANT PATHOLOGY RESEARCH ASSISTANT: SUBTROPICAL HORTICULTURAL RESEARCH STATION

May 2019 - Aug. 2019

- Designed a molecular approach to identify the presence of pathogens on/in over 500 insects isolated from cacao fields in Brazil and Ecuador
- Developed DNA extraction protocols for poorly stored and extremely small specimens (< 3 ng of DNA) suspected to be vectors of cacao diseases
- Evaluated rate and routes of infection of *Neofusicoccum* and *Phytophthora* on over 200 pods to determine susceptibility for cacao breeding program

### Marshall Laboratory, National High Magnetic Field Laboratory

Tallahassee, FL

NANOPARTICLE SYNTHESIS RESEARCH ASSISTANT: ION CYCLOTRON RESONANCE GROUP

May 2018 - Aug. 2018

- Created magnetic nanoparticles (< 20 nm) to identify and extract compounds in crude oil that are chromatographically inseparable due to volatility
- Fabricated molecularly imprinted polymers to have a high selectivity for binding, detecting, and separating various contaminants in crude oil

### Rao Laboratory, Florida State University

Tallahassee, FL

FOOD SAFETY AND QUALITY RESEARCH ASSISTANT: DEPARTMENT OF NUTRITION, FOOD, AND EXERCISE SCIENCES

Aug. 2017 - May 2019

- Synthesized molecularly imprinted polymers using iron (II, III) oxide particles to extricate porcine hemoglobin and pesticides in tainted foods
- Constructed an indirect non-competitive ELISA to investigate epitopes of two monoclonal antibodies for use in anti-porcine hemoglobin assay

## Awards & Honors

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2021	Diversity Programs in Engineering Sloan Grad Scholar Award, Cornell University	Ithaca, NY
2021	CU Empower Outstanding Peer Mentor Award, Cornell University	Ithaca, NY
2021	Honorable Mention for Ephraim Garcia Graduate Excellence in Mentoring, Cornell University	Ithaca, NY
2020	Fischell Graduate Scholarship in Bioengineering, Cornell University	Ithaca, NY
2020	Cornell Graduate School Dean's Excellence Fellowship	Ithaca, NY
2020	Garnet and Gold Scholar, Florida State University	Tallahassee, FL
2019	Recognized as one of the top student employees by USDA-ARS Southeast Area in PEDAL, 2(3) 9	Miami, FL
2019	Certificate of Research Excellence, Florida State University	Tallahassee, FL
2019	<b>3rd place</b> , Toxicology & Safety Evaluation Division, Institute of Food Technologists	New Orleans, LA
2019	<b>Finalist</b> , College of Human Sciences Research Showcase, Florida State University	Tallahassee, FL
2018-2020	Cummings Scientific Scholarship for Chemical and Biomedical Engineering	Tallahassee, FL
2018	<b>1st place</b> , Toxicology & Safety Evaluation Division, Institute of Food Technologists	Chicago, IL
2018	Garnet and Gold Scholar Society IDEA Grant, Florida State University	Tallahassee, FL
2018	<b>2nd place</b> , College of Human Sciences Research Showcase, Florida State University	Tallahassee, FL
2016-2018	Merit Scholarship, Florida State University	Tallahassee, FL
2016-2020	President's List: three semesters; Dean's List: three semesters, Florida State University	Tallahassee, FL
2016-2020	Bright Futures Florida Academic Scholarship, State of Florida	Tallahassee, FL

## Publications

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### Non-Specific Binding and Cross-Reaction of ELISA: A Case Study of Porcine Hemoglobin Detection

2021

X.Y. JIANG, M. WU, **J.E. ALBO**, Q.C. RAO

 [10.3390/foods10081708](https://doi.org/10.3390/foods10081708)

FOODS, 10(8) 1708

- Identified conditions leading to false immunodetection results caused by non-specific binding (NSB) and cross-reaction and discussed the necessity for antibody and assay validation to minimize false-positive/negative immunodetection results

### Engineering Brain-Specific Pericytes from Human Pluripotent Stem Cells

2020

R. JESKE\*, **J.E. ALBO\***, M. MARZANO\*, J. BEJOY, Y. LI (\*DENOTES EQUAL CONTRIBUTION)

 [10.1089/ten.TEB.2020.0091](https://doi.org/10.1089/ten.TEB.2020.0091)

TISSUE ENGINEERING PART B: REVIEWS, 26(4) 367-382

- Reviewed techniques, improvements, and future directions for differentiating brain-specific pericytes and their roles in neurodegenerative diseases

### Rapid Molecular Identification of Scolytinae (Coleoptera: Curculionidae)

2019

**J.E. ALBO**, J.P. MARELLI, A.S. PUIG

 [10.3390/ijms20235944](https://doi.org/10.3390/ijms20235944)

INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES, 20(23) 5944

- Developed a molecular approach to yield results in less than 36 hours for identification of field insect samples from Brazil and Ecuador suspected of being vectors of disease in *Theobroma cacao* at low concentrations from degraded DNA

### Challenges in SERS-based Pesticide Detection and Plausible Solutions

2019

A.S. BERNAT\*, M. SAMIWALA\*, **J.E. ALBO**, X.Y. JIANG, Q.C. RAO (\*DENOTES EQUAL CONTRIBUTION)

 [10.1021/acs.jafc.9b05077](https://doi.org/10.1021/acs.jafc.9b05077)

JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY, 67(45) 12341-12347

- Reviewed challenges associated with surface-enhanced Raman spectroscopy (SERS) based assays for detection of pesticides in food samples and suggested improvements for common drawbacks of selectivity, reproducibility, and nonspecific binding

## Skills

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### Instruments

Flow cytometry, Gas chromatography, Low pressure liquid chromatography, Raman spectroscopy, UV-Vis spectroscopy, VHX digital microscope

### Molecular Biology

Agarose gel electrophoresis, Analysis of DNA sequences (Sanger), Bacteria, fungi, and insect DNA extractions, DNA and PCR quantification, iPSC cell culturing, PCR program development

### Protein

Antibody and protein purification, ELISA development, SDS-PAGE gel electrophoresis, Western Blot, Nanoparticle synthesis for antibody or protein attachment

### Programming/Software

Aspen, Geneious Prime, JMP, LaTeX, MATLAB, Python

# Presentations

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## **Patient-derived tumor organoids for high-throughput drug screening**

J.E. ALBO, J.P. LEONARD, O. ELEMENTO

POSTER: CORNELL BME RESEARCH CLINICAL IMMERSION SYMPOSIUM

Aug. 2021

Ithaca, NY

## **Characterization of Silica-coated Iron (II, III) Oxide Magnetic Nanoparticles for Pesticide Detection**

A.S. BERNAT, J.E. ALBO, X.Y. JIANG, Q.C. RAO

ORAL: USDA PROGRAM DIRECTOR MEETING; POSTER: IFT19 FEED YOUR FUTURE

Oct. 2019; Jul. 2019

San Angelo, TX; New Orleans, LA

## **Preparation of Glyphosate-specific Molecularly Imprinted Polymers with Silica-coated Iron (II, III) Oxide Magnetic Particles for Glyphosate Detection**

A.S. BERNAT, J.E. ALBO, X.Y. JIANG, Q.C. RAO

POSTER: FLORIDA ASSOCIATION OF FOOD PROTECTION ANNUAL EDUCATIONAL CONFERENCE

May 2019

Fort Lauderdale, FL

## **Co-precipitation Synthesis of Iron (II, III) Oxide Magnetic Nanoparticles**

A.S. BERNAT, J.E. ALBO, X.Y. JIANG, Q.C. RAO

ORAL: COLLEGE OF HUMAN SCIENCES RESEARCH SHOWCASE, FLORIDA STATE UNIVERSITY

Feb. 2019

Tallahassee, FL

## **Development of Magnetic Iron (II, III) Oxide Particles for the Detection of Food Contaminants**

J.E. ALBO, Q.C. RAO

ORAL: FALL RESEARCH DAY, FLORIDA STATE UNIVERSITY

Nov. 2018

Tallahassee, FL

## **Molecularly Imprinted Polymer-Based Sensor for the Detection of Porcine Hemoglobin in Foods**

J.E. ALBO, Q.C. RAO

POSTER: PRESIDENT'S SHOWCASE OF UNDERGRADUATE RESEARCH EXCELLENCE, FLORIDA STATE UNIVERSITY

Oct. 2018

Tallahassee, FL

## **Characterization of Two Anti-Hemoglobin Monoclonal Antibodies to Fight Food Fraud**

X.Y. JIANG, J.E. ALBO, W. DONG, Q.C. RAO

POSTER: IFT18 A MATTER OF SCIENCE + FOOD

Jul. 2018

Chicago, IL

## **Effect of Coating and Blocking Agents on Sandwich ELISA Development for Porcine Blood Detection**

X.Y. JIANG, J.E. ALBO, Q.C. RAO

ORAL: COLLEGE OF HUMAN SCIENCES RESEARCH SHOWCASE, FLORIDA STATE UNIVERSITY

Feb. 2018

Tallahassee, FL

# Selected Leadership Positions

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## **Cornell University EMPower (CU EMPower)**

**GRADUATE STUDENT MENTOR**

- Mentor four first-year URM or first-generation undergraduate Cornell engineering students to support personal and academic development and ease transition into college
- Guide undergraduate students in development of healthy study habits and time allocation for balancing research and internship opportunities for career development

2020-Present

Ithaca, NY

## **FAMU-FSU Engineering Peer Mentor Program & FSU Student Council for Undergraduate Research**

**CHEMICAL ENGINEERING MENTOR**

- Advised first and second year engineering students in establishing research opportunities and maintained weekly meetings to address progress and future career directions
- Designed and executed cereal-based iron extraction project to stimulate interest of students in local title 1 high schools in STEM-based careers

2018-2020

Tallahassee, FL

## **FSU Professional Clothing Closet**

**CO-FOUNDER AND EXECUTIVE COMMITTEE MEMBER**

- Initiated collaboration between FSU, JCPenney, and Kohl's to provide free professional attire and narrow opportunity gap for less fortunate students
- Coordinated and delegated tasks between the student team and committee members to further advance the success of the organization

2017-2020

Tallahassee, FL