THE UNIVERSITY OF ALABAMA

**2018 APPLICATION FOR**

RESEARCH EXPERIENCE FOR UNDERGRADUATE (REU) IN CHEMISTRY

MAY 29 – AUGUST 3, 2018

APPLICATIONS DUE FEBRUARY 28, 2018

1. Full name: Ms./Mr. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Preferred name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ E-mail address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

2. Address: (present): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(permanent): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Permanent home phone number: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

College phone number where you can be reached in March/April/May: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Date of Birth: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 4. Citizenship: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. College(s) and University(ies) attended, with dates:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

6. Academic Status: Sophomore \_\_\_\_\_\_\_\_\_\_\_\_ Junior \_\_\_\_\_\_\_\_\_\_ Senior \_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Expected graduation date \_\_\_\_\_\_\_\_\_\_\_\_\_ Overall GPA \_\_\_\_\_\_\_\_ Chem. GPA \_\_\_\_\_\_\_\_\_

8. List courses taken in college and grades. (Indicate those you are taking at present).

**Course Grade Course Grade**

General Chemistry I \_\_\_\_\_\_ General Chemistry II \_\_\_\_\_\_

Organic Chemistry I \_\_\_\_\_\_ Organic Chemistry II \_\_\_\_\_\_

Organic Laboratory I \_\_\_\_\_\_ Organic Laboratory II \_\_\_\_\_\_

Physical Chemistry I \_\_\_\_\_\_ Physical Chemistry II \_\_\_\_\_\_

Other Chemistry name: \_\_\_\_\_\_ Other Chemistry name: \_\_\_\_\_\_

Mathematics I \_\_\_\_\_\_ Mathematics II \_\_\_\_\_\_

Mathematics III \_\_\_\_\_\_ Mathematics IV \_\_\_\_\_\_

Physics I \_\_\_\_\_\_ Physics II \_\_\_\_\_\_

Biology I \_\_\_\_\_\_ Biology II \_\_\_\_\_\_

Other Science: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Language: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

9. Earliest date you could begin research: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

10. Do you plan to attend graduate school? \_\_\_\_\_\_\_\_\_\_\_\_\_ Yes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_No

If "yes" in chemistry (\_\_\_\_\_) or biochemistry (\_\_\_\_\_)? Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_?

Does medical school figure in your plans? \_\_\_\_\_\_\_\_\_\_\_\_\_\_Yes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ No

11. Names, titles and addresses of two persons whom you have asked to write letters of recommendation. Include at least one person who can comment on your laboratory skills.

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Name Address

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Name Address

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These letters should be sent to: Ms. Monika Swanger, Dept. of Chemistry, Box 870336

The University of Alabama, Tuscaloosa, AL 35487-0336

12. Enclose with this application a short, one-page letter in which you summarize your career goals. Indicate how you think that participation in this program will assist you in attaining these goals.

13. Indicate your top four (or more) choices of research projects or areas in order of preference:

\_\_\_\_\_ First Choice \_\_\_\_\_Second Choice \_\_\_\_\_Third Choice

\_\_\_\_\_ Fourth Choice \_\_\_\_\_Other Choice

1 Amine-Quinone Polymers and the Protection of Aluminum Aircraft Alloys against Corrosion

2 Antibiotic Resistance of Gram-Positive Pathogens

3 Asymmetric Reaction Methodology

4 Beyond Raney Nickel: Next Generation Hydrogenation Catalysts

5 Binding of Potential Drugs to Cytochrome P450

6 Biochemistry of Chromium

7 Biochemistry of RNA methyltransferases regulating meiosis

8 Building a Targeted, Magnetically Triggered Drug Delivery System for Cancer Chemotherapy

9 Carbon Dioxide Capture, Reactivity and Sequestration

10 Catalysts for Activation of C-H Bonds

11 Chemical Bonds for Storing Energy via Catalysis

12 Chemical Ordering in Binary Alloy Nanoparticles

13 Chemical Sensing of Biologically Relevant Carboxylates using Fingerprinting Techniques

14 Cocrystals - Designing Molecular Pairs to Assemble together in a Cocrystal and X-ray Crystallography of Cocrystals

15 Computational Approaches to Advanced Energy Systems - Actinide and Lanthanide Chemistry

16 Computational Biochemistry: Acid/Base Properties and Thermochemistry of Peptides

17 Computational Modeling of Complex Scattering Data

18 Computational Studies of Homogeneous and Heterogeneous Catalytic Reactions

19 Concentration, Solubilization, and Detection of Polycyclic Aromatic Hydrocarbons (PAHs)

20 Designer Alloys Built by the Self-Assembly of Metal Alloy Nanoparticles

21 Designing Metal Based Drugs that Target Cancerous and Bacterial Cells

22 Development of Catalytic Diversity in an Enzyme Scaffold

23 Development of Chemical Sensors for Airborne Pollutants

24 Development of Novel Catalytic Reaction Methodology

25 DNA Origami without the DNA

26 Dye-Sensitized Solar Cells: Designing Molecules to Move Electrons Around

27 Electrochemical and Optical Sensors

28 Electron Transfer in DNA Processing Enzymes

29 Environmentally Friendly Methods for Converting Carbon Dioxide to Useful Products

30 Ethics in Chemistry

31 Fluorescent Nucleosides for DNA and RNA

32 Investigation of Protein Dynamics using Mass Spectrometry

33 Mass Spectrometry Ionization of Biomolecules

34 Mass Spectrometry Studies of Peptides

35 Measurements of Potential Single-Molecule Rectifiers

36 Medium Ring Carbocycles and Cytotoxic Xenia Diterpenoids

37 Metal and Metal Oxide Nanoparticle Catalysis

38 Metallotherapeutics

39 Metals and Free Radicals in Proteins

40 Nanoelectrochemistry for Ultrasensitive Detection

41 Nanomaterials for Batteries

42 Nanoparticle Synthesis for Solar Cell Applications

43 New Catalysts for Environmentally Benign Synthesis

44 New Reagents for Organic Synthesis

45 Novel Antiinflammatory and Anticancer Agents

46 One-Pot Heterogeneous Catalysts for Green Chemistry

47 Organic Solar Cells

48 Organometallic Catalysts in Organic Synthesis

49 Polymer-based Phosphate and Nitrate Sensors for Environmental Applications

50 Porous Carbon-Based Catalysts for Fuel Cells

51 Searching for Better Perovskite Solid Solar Cells

52 Separating Carbon Nanotubes by Derivatized End-Groups Followed by Ion-Exchange Chromatography

53 Structure and mechanism of antibiotic resistance rRNA methyltransferases

54 Synthesis of Agents for the Treatment of Diabetes

55 Synthesis of Inorganic Materials Using Biological Templates

56 Synthesis of Nanostructured Thermoelectrics: Materials that Convert Heat into Electrical Power

57 Synthesis of Novel Separation Geometries

58 Synthesis of Novel, Geologically-Inspired Oxides for Magnetic Applications

59 Synthesizing New Organic Molecules Capable of Reversible Photo-Electro-Stimulated Flexing

60 Synthesizing Organic Molecules that Reversibly Change Shape and Color upon Redox Change

61 The Design and Synthesis of Conjugated Polymers for Solar-cell Applications

62 The Synthesis of Charged, Ultra-high-performance Polymers

63 The Synthesis of Polyimines: Polymers for CO2 Capture and Drug Delivery

64 Thin Film Synthesis of Novel Oxide Materials Using Pulsed Laser Deposition

65 Total Synthesis of Natural Products

**EVALUATION REPORT**

**SUMMER RESEARCH EXPERIENCES FOR UNDERGRADUATES (REU) PROGRAM IN CHEMISTRY**

ATTN.: Ms. Monika Swanger

Summer Undergraduate Research Program

Department of Chemistry, Box 870336

The University of Alabama

Tuscaloosa, AL 35487

Student Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Instructions to Reference: Please comment on the applicant's background and achievement in chemistry, his or her laboratory skills, and his or her potential for independent study. Please mail this form to Dr. John Vincent at the above address. Thank you for your help.

**Evaluation of Student Excellent Poor**

Work habits 1 2 3 4 5 No basis to judge

Ability to follow directions 1 2 3 4 5 No basis to judge

Scientific curiosity 1 2 3 4 5 No basis to judge

Maturity 1 2 3 4 5 No basis to judge

Chemical knowledge for college level 1 2 3 4 5 No basis to judge

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Position or Title: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_