THE UNIVERSITY OF ALABAMA

**2017 APPLICATION FOR**

RESEARCH EXPERIENCE FOR UNDERGRADUATE (REU) IN CHEMISTRY

MAY 30 - July 31, 2017

APPLICATIONS DUE, FEBRUARY 28, 2017

Mr.

1. Full name: Ms. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ 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:

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

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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).

**Chemistry 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 name: \_\_\_\_\_\_ 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. Amy Ryan, 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 Asymmetric Reaction Methodology

2 Beyond Raney Nickel: Next Generation Hydrogenation Catalysts

3 Binding of Potential Drugs to Cytochrome P450

4 Biochemistry of Chromium

5 Biochemistry of RNA methyltransferases regulating meiosis

6 Carbon Dioxide Capture, Reactivity and Sequestration

7 Catalysis in microfluidic devices

8 Chemical Bonds for Storing Energy via Catalysis

9 Chemical Ordering in Binary Alloy Nanoparticles

10 Chemical Sensing of Biologically Relevant Carboxylates using Fingerprinting Techniques

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

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

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

14 Computational Studies of Homogeneous and Heterogeneous Catalytic Reactions

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

16 Conducting Polymers for Surface Coatings

17 Designing Metal Based Drugs that Target Cancerous and Bacterial Cells

18 Development of Catalytic Diversity in an Enzyme Scaffold

19 Development of Chemical Sensors for Airborne Pollutants

20 Development of Novel Catalytic Reaction Methodology

21 Diffuse Scattering Studies on Single Crystals of Doped Vanadium Oxides

22 Electrochemical and Optical Sensors

23 Environmentally Friendly Methods for Converting Carbon Dioxide to Useful Products

24 Ethics in Chemistry

25 Gas-phase Structures of Peptide Ions

26 Hydrogen Storage Opportunities with Novel Valence Structures

27 Improving the Synthesis of Peptide Nucleic Acids

28 Inorganic Coordination Compounds for Dye-Sensitized Solar Cells

29 Mass Spectrometry Studies of Peptides

30 Measurements of Potential Single-Molecule Rectifiers

31 Mechanisms of Carbohydrate Chemistry in Glycosyltransferase Enzymes

32 Medium Ring Carbocycles and Cytotoxic Xenia Diterpenoids

33 Metal and Metal Oxide Nanoparticle Catalysis

34 Metallotherapeutics

35 Metals and Free Radicals in Proteins

36 MnBi Nanoparticles for High Energy Permanent Magnets

37 Modified DNAs and RNAs

38 Nanoelectrochemistry for Ultrasensitive Detection

39 Nanomaterials for Batteries

40 Nanoparticle Synthesis for Solar Cell Applications

41 New Catalysts for Environmentally Benign Synthesis

42 New Dyes for Non-Linear Optical Applications – Advanced Materials

43 New Reagents for Organic Synthesis

44 Novel Antiinflammatory and Anticancer Agents

45 One-Pot Heterogeneous Catalysts for Fixed Bed Reactors

46 Organic Solar Cells

47 Organic Synthesis of New Hydrogen Bonding Molecules

48 Organometallic Catalysts in Organic Synthesis

49 Polymer Micelles for a Magnetically Triggered, Targeted Drug Delivery System

50 Polymer Templating of Inorganic Nano-structures

51 Polymer Waveguides for Explosives Detection

52 Polymer-based Phosphate and Nitrate Sensors for Environmental Applications

53 Polymerization of Transition Metal Complexes for Non-Platinum Group Metal Fuel Cell Catalysts

54 Searching for Better Perovskite Solid Solar Cells

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

56 Stable Phosphorus-derived Biradicals and Their Chemistry

57 Structure and mechanism of antibiotic resistance rRNA methyltransferases

58 Synthesis of Agents for the Treatment of Diabetes

59 Synthesis of Inorganic Materials Using Biological Templates

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

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

62 Synthesis of Unusual Valence Structures

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

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

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

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

67 Total Synthesis of Natural Products

**EVALUATION REPORT**

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

ATTN.: Ms. Amy Ryan

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: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_