CSUF MARC U*STAR
UNDERGRADUATE RESEARCH SCHOLARS PROGRAM
for
June 1, 2020 through May 31, 2022

Application Deadline: April 17, 2020 (decisions made in late May)

APPLICANT INFORMATION

Name: _____
Last First Middle

Date of Birth (MM/DD/YY): _____ Campus Wide ID _____

Gender (optional): _____

U.S. Citizenship: ☐ Yes ☐ No (Permanent Resident No.: _____)

Current Address: Permanent Address: ☐ Same as Current Address

_____ _____

_____ _____

Telephone Home: _____ Mobile: _____

Email address: _____

Ethnicity (select all that apply):

☐ American Indian/Alaskan/Native American ☐ African-American/Black ☐ Asian-American

☐ European-American ☐ Filipino/Filipino-American ☐ Latin/Other Spanish American

☐ Mexican/Mexican-American ☐ Mid Eastern-American ☐ Pacific Islander

☐ Puerto Rican ☐ Other: _____

Primary language spoken at home: _____

Parent's Education (Highest level completed)

Father ☐ Some H.S. ☐ H.S. Diploma/GED ☐ Some College ☐ Bachelor's
☐ Some graduate school ☐ Masters ☐ PhD ☐ Other _____

Mother ☐ Some H.S. ☐ H.S. Diploma/GED ☐ Some College ☐ Bachelor's
☐ Some graduate school ☐ Masters ☐ PhD ☐ Other _____

CAREER OBJECTIVE INFORMATION

Advanced degree objective: ☐ Masters ☐ PhD ☐ MD/PhD ☐ PharmD/PhD
☐ DDS/PhD ☐ OD/PhD ☐ DO/MD ☐ Other _____

COLLEGE INFORMATION

College/University attended: _____ Dates attended: _____
Major: _____ Units completed: _____

College/University attended: _____ Dates attended: _____
Major: _____ Units completed: _____

College/University attended: _____ Graduation date: _____
Major: _____ Degree: _____

Current CSUF Academic Level:

Total units completed: _____

Major(s): _____ Minor(s): _____

Overall GPA: _____ Science GPA*: _____ Fall 2019 GPA: _____

** Please use the GPA calculator* http://www.fullerton.edu/aac/resources/gpa_calculator.php

Date you entered CSUF (MM/YY): _____

Will you graduate in June 2022? ☐ yes ☐ no

If not June 2022, please indicate your expected graduation date: _____

CURRICULUM VITAE*

(Please provide your CV as a separate sheet or electronic file, with this application.)
*Many qualified applicants may not have entries in each category.

EDUCATION:

Community College	Major	Year degree earned, Cumulative GPA
University	Major	Current status, Cumulative GPA
		Intended Degree, Expected date of graduation

WORK EXPERIENCE:

This category should include off-campus work as well as any on-campus ***teaching***, ***tutoring***, and ***research*** performed. Indicate location, dates and brief description of activities in reverse chronological order (latest to earliest).

PROFESSIONAL AND NON-PROFESSIONAL AFFILIATIONS:

This category should include student- and science-oriented memberships in reverse chronological order.

AWARDS AND HONORS:

This category should include academic and extracurricular honors and awards, as well as any research grant awards, in reverse chronological order.

SERVICE AND VOLUNTEER ACTIVITIES:

These activities should be cumulative and inclusive. Indicate site and dates of involvement in reverse chronological order.

SPECIAL SKILLS:

This category may include language proficiency, computer knowledge (both hardware and software), as well as experience with scientific instrumentation and protocols. Rate your ability as: **novice** – have used with supervision/ have some familiarity; **competent** – can use on your own without supervision; **mastery** – can troubleshoot protocol and can teach someone else.

PUBLICATIONS/PRESENTATIONS (OPTIONAL):

Most applicants will not have entries in this category (after all, developing this area is one of the purposes of the MARC program). If you have any publications, published abstracts, or presentations (both poster and oral), list them in reverse chronological order. Use this format: Last name of first author, initials, and co-authors last name, initials. (date) "title," journal. **volume**, pages.

HOBBIES:

This category should include activities that show how you spend your non-academic and non-service/volunteer time.

CAREER ESSAY 1

In 500 words, please respond to the following prompt.

What are your future educational and career goals? After graduating from Cal State Fullerton, what additional degree(s) are you interested in obtaining? What professional setting do you see yourself pursuing for your long-term research goals?

CAREER ESSAY 2

In 500 words, please respond to the following prompt.

Why are you interested in entering the Cal State Fullerton MARC Program and conducting scientific research? Please address what you see as the benefits of the program in helping you meet your immediate and long-term research goals. Please also discuss any current research you are conducting and how it has influenced your career decision(s).

OTHER SUPPORT

Below provide a statement of any financial aid that you currently receive and the names of organizations providing this support. This declaration will in no way cause your application to be viewed with bias or be a factor in the selection of our candidates.

SPECIAL CONSIDERATIONS

Please indicate whether you:

- ☐ Are an under-represented minority (NIH defines this category as African American, Pacific Islander, Hispanic American, or Native American.)
- ☐ Are applying as a financially-disadvantaged student (include a copy of your last federal income tax reporting form).
- ☐ Are applying as someone who comes from a social, cultural, and/or educational environment that has demonstrably worked against you being able to obtain the knowledge, skills, and abilities that are needed to develop and participate in a research career (e.g. from a high school that does not send a high percentage of students to four-year colleges).
  High School _____ Graduation Date:_____
- ☐ Are applying as an individual with a physical disability or mental impairment that substantially limits one or more major life activities.
- ☐ Are the first person or generation in your family to attend a four-year university.

SPECIAL CONSIDERATIONS ESSAY

In 500 words, please respond to the following prompt.

Students who meet one or more of the special considerations on the previous page have often encountered impediments to advancing their education. What impediments have you had, and how would your pursuit of higher education benefit from participation in the Cal State Fullerton MARC Program?

PREDICTED ACADEMIC SCHEDULE for 2020-2021 and 2021-2022

Please complete the following table, indicating the courses you plan to enroll in each semester (including summers) over your final two academic years. Include course names, (units), and whether the course is a GE or major requirement (BIOL 309 - Intermediate Molecular Biology (3) is provided as an example under Fall 2020). MARC scholars are also expected to enroll in independent research (1 unit), MARC Proseminar (1 unit), and the MARC Scientific Writing Workshop (1 unit) each semester. MARC Boot Camp (6-8 weeks) and ENGL363 (3 units) are also required during Summer 2020 and Spring 2021, respectively. Please include the aforementioned five courses to the appropriate semesters.

Fall 2020 Courses (units)	GE/Major	Spring 2021 Courses	GE/Major
BIOL309 Int Mol Biol (3)	Major		

Fall 2021 Courses (units)	GE/Major	Spring 2022 Courses	GE/Major

Summer 2020 Courses (units)	GE/Major	Summer 2021 Courses	GE/Major

LETTERS OF RECOMMENDATION

List the names of three individuals, of which **two must be faculty,** who will be submitting letters of recommendation on your behalf.

It is the applicant's responsibility to make sure that all three letters are submitted by the application deadline. Submission of fewer than three letters may put an application at a disadvantage.

ALL LETTERS MUST BE RECEIVED NO LATER THAN THE APPLICATION DEADLINE of April 17, 2020.

Name:_____ E-mail (required): _____

Title/University: _____ Telephone: _____

Name:_____ E-mail (required): _____

Title/University: _____ Telephone: _____

Name:_____ E-mail (required): _____

Title/University: _____ Telephone: _____

TRANSCRIPTS

Transcripts (unofficial are acceptable) of coursework completed at the date of application submission.

Include non-Cal State Fullerton transcripts, if applicable.

Transcripts must be received before the application deadline (April 17, 2020).

MARC PROGRAM INFORMATION

How did you learn about the MARC-CSUF Program? (Check all that apply)

☐ Recruitment/Research Conference (specify) _____

☐ Past MARC Scholar (name) _____

☐ Current MARC Scholar (name) _____

☐ CSUF department/staff/student (specify) _____

☐ MARC-CSUF web-site

☐ Your previous college department (specify) _____

☐ Faculty member or advisor at your previous college (name) _____

☐ Other (specify) _____

APPLICANT'S SIGNATURE

Signature _____ Date _____

By signing this application, I certify that all information provided is accurate to the best of my knowledge. I further certify that I will not be a recipient of any other federally-sponsored traineeships (e.g. McNair, LSAMP, STEER), or a similar training award that provides a stipend, or otherwise duplicates a NIH-funded MARC National Research Service Award. I understand and agree that I will not be eligible for a MARC scholarship if I accept any other federally-sponsored traineeship as described.

Send all application materials by April 17, 2020, including letters of recommendation and transcripts to acohen@fullerton.edu

For information about the MARC program, you may contact:

Dr. Amybeth Cohen (MARC Director)
Department of Biological Science
California State University, Fullerton
acohen@fullerton.edu

RESEARCH INTERESTS

Below are a list of professors who participate in the MARC Program, and a brief summary of their research interests. Check all professors that conduct research in your area of interest. Note that additional faculty mentors may be listed on the MARC websites, who have just been added. If interested in a professor(s) not listed, write the name(s) at end of the list.

☐ Biological physics, soft, and active matter; quantitative measurements of softy, squishy matter using laser tweezers and high-speed microscopy.
Mentor: Dr. Wylie Ahmed *Physics*

☐ All aspects of human memory, including the cognitive processes underlying memories for non-existent events (false memories), the effects of oxytocin on face identification to test models of face recognition memory, and the cognitive mechanisms underlying deception.
Mentor: Dr. Iris Blandon-Gitlin *Psychology*

☐ Cell biology of phagocytosis; genetic approaches to elucidating mechanisms used by white blood cells to control the killing of engulfed microbes.
Mentor: Dr. Catherine Brennan *Biological Science*

☐ Molecular biology of microbe-host interactions; bacterial genes and signals involved in forming a symbiosis with plants.
Mentor: Dr. Esther Chen *Biological Science*

☐ Regulation of photosynthetic gene expression in plants; red and yellow light and Ca^{2+}/CaM signaling pathways.
Mentor: Dr. Amybeth Cohen *Biological Science*

☐ Analysis of protein and lipid interactomes of TRP ion channels; roles of metal transporters and ion channels in the neuropathology of Alzheimer's disease and other neurodegenerative disorders; drug discovery for metal transporters and ion channels.
Mentor: Dr. Math P. Cuajungco *Biological Science*

☐ Electrochemistry of energy and sensing for applications in biomedicine, environmental science, and alternative energy.
Mentor: Dr. John Haan *Chemistry and Biochemistry*

☐ Reproductive anatomy and physiology of internally fertilizing fishes; endocrine regulation of gamete development in fishes.
Mentor: Dr. Kristy Forsgren *Biological Science*

☐ Properties and chemistry of aerosols naturally present in the atmosphere (such as sea salt and burned biomass) interacting with man-made pollutants, to better understand human effects on global climate change.
Mentor: Dr. Paula Hudson *Chemistry and Biochemistry*

☐ Role of ion channels in sensing and adaptation to environmental conditions in protozoan parasites. Electrophysiological characterization of channels in parasites.
Mentor: Dr. Veronica Jimenez Ortiz *Biological Science*

☐ Physiology and biochemistry of microbial manganese oxidation. Microbial interactions with metals and metal cycling.
Mentor: Dr. Hope Johnson *Biological Science*

☐ Understanding how post-translational modifications alter the activity of splicing factors and in turn affect cellular gene expression.
Mentor: Dr. Niroshika Keppetipola *Biochemistry*

☐ Computational Applied Mathematics: modeling, numerical algorithms, simulation, optimization, pattern recognition, DNA microarrays, cancer detection.
Mentor: Dr. Charles Lee *Mathematics*

☐ Structure, function, regulation and gene expression of proteins associated with transport and storage of iron and copper in mammals; biochemistry of inflammation in relation to copper and iron metabolism.
Mentor: Dr. Maria Linder *Chemistry and Biochemistry*

☐ Evolutionary and proximate underpinnings of human behavioral variation; the roles of health, socioecology, and attractiveness in determining human social status, fertility, and personality. **Mentor: Dr. Aaron Lukaszewski** *Psychology*

☐ Molecular mechanisms of Notch receptor signaling by typical and atypical ligands; developmental and cell biology of elastic fiber proteins.
Mentor: Dr. Alison Miyamoto *Biological Science*

☐ Behavioral ecology, endocrinology and conservation biology of the nonhuman primates; sources and consequences of variation in social behavior among individuals, across groups and populations; the biology of parenting, the evolution of male-female bonds, and sex differences in behavior and ecology.
Mentor: Dr. Nga Nguyen *Anthropology*

☐ Evolution and functional differentiation of proteins involved in stress and immune responses.
Mentor: Dr. Nikolas Nikolaidis *Biological Science*

☐ Comparative functional anatomy, biomechanics, and biomaterials focusing on marine systems. Emphasis on biomimetic filters.
Mentor: Dr. Misty Paig-Tran *Biological Science*

☐ Regulation of apolipoprotein-E gene expression, and its role in Alzheimer's disease.
Mentor: Dr. Nilay Patel *Biological Science*

☐ Visual recognition of objects and faces, using both applied and evolutionary perspectives.
Mentor: Dr. Jessie Peissig *Psychology*

☐ Identification and characterization of antibiotic resistance mechanisms, their dissemination, evolution and impact in morbidity and mortality of bacterial infections.
Mentor: Dr. Maria Soledad Ramirez *Biological Science*

☐ Investigation of the neurophysiological basis of memory in larval zebrafish - an impressive molecular vertebrate system to further understand the neural basis of learning and memory.
Mentor: Dr. Adam Roberts *Psychology*

☐ Mechanism Design, robotics, biomechanics, assistive technologies, and human-robot interaction.
Mentor: Dr. Nina Robson *Mechanical Engineering*

☐ Molecular biology of plant-pathogen interactions; protein-protein interactions and signaling in disease resistance.
Mentor: Dr. Melanie Sacco *Biological Science*

☐ Synthesis and evaluation of small molecule inhibitors for proteins related to human health and disease.
Mentor: Nicholas Salzameda *Chemistry and Biochemistry*

☐ Twin studies of behavioral development; evolutionary and psychological approaches to behavior.
Mentor: Dr. Nancy Segal *Psychology*

☐ Human visual perception and color vision. Recent topics include color from motion, optical illusions, and color vision screening tests.
Mentor: Dr. Eriko Self *Psychology*

☐ Evolutionary genomics, population genetics, experimental evolution, aging, and immune defense in *Drosophila melanogaster*.
Mentor: Dr. Parvin Shahrestani *Biological Science*

☐ Uptake and translocation of environmental pollutants into wetland and upland plants. Potential for use of algae to reduce wastewater contaminants and produce bioproducts.
Mentor: Dr. Garrett Struckhoff *Civil and Environmental Engineering*

☐ Molecular genetics and mechanism that contribute to the virulence of pathogenic bacteria.
Mentor: Dr. Marcelo Tolmasky *Biological Science*

☐ The anatomy and pharmacology of the basal ganglia related to Parkinson's disease and motor function. The relationship between dopamine and adenosine and their combined effects on motor function.
Mentor: Dr. Jennifer Trevitt *Psychology*

☐ Mathematical modeling of biological systems. Computational studies of cellular stress responses and biochemical oscillators.
Mentor: Dr. Anael Verdugo *Mathematics*

☐ **Mentor not listed above from CSUF website information**_____

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☐ Understanding how double-stranded DNA viruses assemble, and particularly how the capsid comes together and the viral genome is packaged via a terminase enzyme.
Mentor: Dr. Marcos Ortega *Chemistry and Biochemistry*

☐ Identification of novel inhibitors of enzymes involved in lipid metabolism and their evaluation as potential therapeutics and development of DNA-based biosensors for detection of various small molecules of interest.
Mentor: Dr. Stevan Pecic *Chemistry and Biochemistry*