

## URA MENTORING PLAN

**URA applicant:** Katelyn Flake  
**BYU faculty mentor:** David Hansen  
**Semester of study:** Fall 2023

**Proposal Title:** Developing Knockout THP-1 Cell Lines for *TREM2*, *MS4A4A*, and *MS4A6A* Genes

### Mentoring Plan

As an Undergraduate Research Associate in the Hansen lab, Ms. Flake will contribute 10-20 hours of laboratory research per week. On a day-to-day basis, she will work closely with Kevin Bretzing, a graduate student who is leading the overall project to study the role of MS4A proteins in Alzheimer's disease. Ms. Flake's research this semester will utilize the following techniques: purifying DNA from cells, PCR amplifying genomic fragments, restriction digest screening, DNA sequencing, flow cytometry, ELISA, western blotting, culture and cryostorage of mammalian cells. Mr. Bretzing will help Ms. Flake 1) plan her research activities, 2) design her experiments with the needed controls, 3) anticipate and order needed reagents, 4) learn the experimental techniques needed to conduct the experiments, and 5) analyze her data.

On a weekly basis, Ms. Flake will provide an electronic accounting of her research activities to Mr. Bretzing and Dr. Hansen. As often as her schedule will permit, Ms. Flake will attend both the weekly Lab Meeting and the weekly MS4A Project Meeting between Dr. Hansen and Mr. Bretzing. The best opportunity to interact with Dr. Hansen and receive direct feedback on her research efforts will be during the weekly Project Meeting. At least once during the semester, Ms. Flake will present one or more of her experimental findings to her research colleagues in the weekly lab meeting.

At least once during the semester, Dr. Hansen will meet with Ms. Flake individually to review her short-term and long-term personal goals, discuss how the URA experiential learning opportunity might be improved to better meet those goals, and discuss the quality of her interactions with Mr. Bretzing and other lab members.

For continued employment in future semesters, Ms. Flake will be expected to write her own URA Renewal application (conforming with the department-provided template) after consulting with Mr. Bretzing and Dr. Hansen to decide on future research aims. After receiving feedback from her mentors on the proposal and after making any needed revisions, she will submit the next application to the department before the URA Renewal application deadline.

*Katelyn Flake*

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Student signature

*David Hansen*

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Faculty signature

*Kevin Bretzing*

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Other mentor signature (optional)