# MONITORING BIOMARKERS FOR MUSCULAR ATROPHY USING AN ELECTRONIC CHIP FOR ASTRONAUT HEALTH

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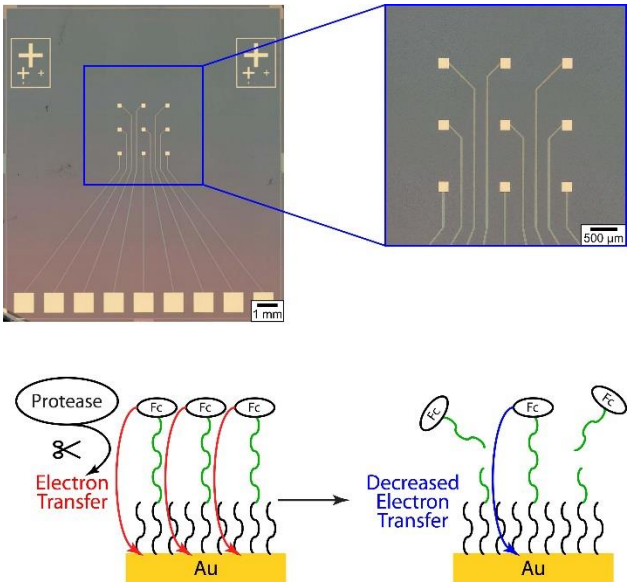
## ABSTRACT

Skeletal muscle atrophy is a serious health problem for astronauts in long-duration space flight under microgravity conditions. Preventative measures against muscle atrophy require specific exercise and dietary regimens. Preemptive measurements to improve treatment have the potential to streamline these regimens, decreasing their daily footprint and increasing astronaut quality of life. The objective of our proposed project is to (1) develop a fully integrated disposable microelectrode array chip (with the size of a stamp) that can be interfaced with a handheld electronic system for simultaneous detection of the a panel of biomarkers to monitor the progression of skeletal muscle atrophy due to disuse under microgravity in long-duration spaceflights; and (2) use such quantitative information to guide the combined countermeasures of physical exercise and pharmaceuticals (i.e. specific protease inhibitors) so that the intensity, duration and frequency of exercise can be reduced.




## REFERENCES

[1] Anderson, M. J., et al (2020) *Biosens Bioelectron* 2020, 112330