



2024 IMPACT CIRCLE

Project Title: The Healthy Selfie Project

Investigator(s) and collaborations: David Furman, PhD

Unmet Need/Primary Question: The Healthy Selfie Project aims to develop a simple and ultra-cheap tool, a photo (selfie), to predict organ aging in an individual.

Background: While methods to evaluate biological organ aging exist, these often require a blood sample and/or tissue biopsy. This and the cost associated with these tests largely restricts evaluation of organ aging to a limited number of people. A study in people that look similar to each other (look-a-likes)¹ show that features derived from the face can be used to understand genetic variation in the population. Another study using three-dimensional images from a Chinese cohort were utilized to predict cellular changes and composition in the blood using RNA sequencing technology². A more recent study by the group of Morgan Levine (Systems Clock) also points to the use of blood to assess organ aging³.

Novel Hypothesis: A facial image taken with a smartphone can provide an ultra-cheap digital tool that predicts a person's biological age for different organs and clinical endpoints related to aging.

Project Proposal: The Healthy Selfie will use data and samples generated from our studies of aging and longevity. We will sequence the blood transcriptomics from a total of 750 people who have been extremely well characterized for many features of aging. Transcriptomic and facial image data will be used to assess immune aging and frequency of blood cells and their gene expression aging signatures and as surrogate markers of organ aging by crossing tissue with blood aging from the Genotype-Tissue Expression (GTEx) Portal. Funding has been secured for sequencing all the samples. We are seeking funding for one FTE data scientist to complete the analysis of the data.

Description of Potential Impact: The development of the Healthy Selfie will enable large scale deployment and democratization of biological aging assessment with significant societal benefit and humanitarian impact. The pairing of digital biological aging assessment with demographic, clinical, lifestyle and exposure data from users will allow for the identification of drivers and delayers of biological aging rates creating opportunities for product development. Providing a tool that anyone with a cellphone can use will allow large scale use that will enable the creation of a massive and universal customer base.

References: 1 - <https://doi.org/10.1016/j.celrep.2022.111257>; 2 - <https://doi.org/10.1038/s42255-020-00270-x> ; 3 - <https://doi.org/10.1101/2023.07.13.5489044>

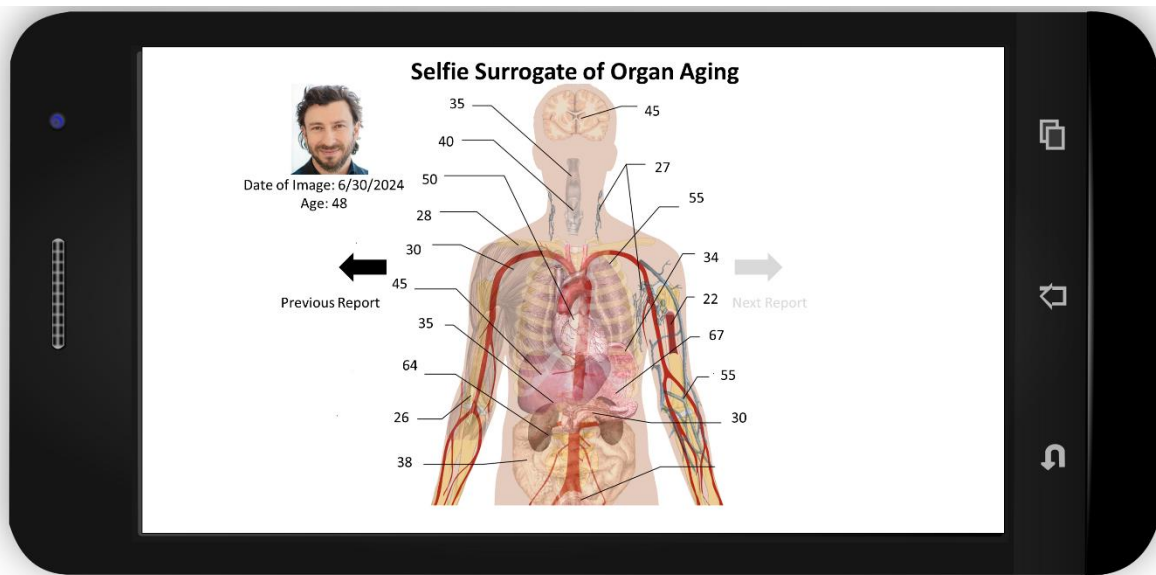


Figure 1. Hypothetical results report from the Healthy Selfie App. The date of the image acquisition and age at time of the image are given with predicted organ ages.