June 5, 2018

**Title of thesis:** Software Implementation for Temperature-Controlled Retinal Pigment Epithelium Heating Device

**Headline:** A software controlling mouse retinal pigment epithelium (RPE) heating device to research therapy for eye diseases

A novel software was developed for controlling a retinal pigment epithelium (RPE) heating device that is used for investigations of temperature-controlled treatment of age-related macular degeneration (AMD) – the worldwide leading unavoidable eye disease causing vision loss. The software communicates with infrared heating laser capable of raising the temperature of mouse RPE located at the bottom of the eye, as well as with light stimulation and recording systems used for electrical recordings from the surface of the eye. Based on the recording, known as electoretinography (ERG), it is possible to estimate the temperature of the RPE and to use this information to control the heating power of the infrared laser.

The developed software enables automation in performing ERG, monitoring patient (mouse) anaesthesia and real-time data analysis. These and other implemented features allow better monitoring and data analysis during heating experiments, hence saving time and effort from the end-user. The software can be further developed to meet the requirements of clinical trials when used in heat therapy of human patients.

The software was developed as a part of master’s thesis of Toni Tamminen at the Department of Neuroscience and Biomedical Engineering.

**Contact details:**
Toni Tamminen, B.Sc. (Tech.)
toni.tamminen@aalto.fi
+358400660476