Background of this technology

As our society ages and digitalization advances, eye fatigue is becoming an issue.

Physical fatigue and symptoms felt due to digital work

Source: Survey on Technological Innovation and Labour 2008 (Ministry of Health, Labour and Welfare)
About eye fatigue

Visible light and blue light can cause inflammation of the retina

Visible light and blue light reach the retina at the back of the eye. Excessive exposure to these lights damages the retina and triggers an inflammatory response.
About this technology

KW lactobacilli balance repair and inflammation

**Inflammation of retinal cells causes eye fatigue. KW lactobacilli shift the balance toward repair.**

Blue light and other factors can irritate the eyes, in turn resulting in inflammation of retinal cells.

KW lactobacilli (L.paracasei KW3110) act on macrophages* to balance inflammation.

*An immune cell that preys on foreign organisms in the body and secretes various regulators; a type of white blood cell
Macrophage cell supernatant stimulated with KW lactobacilli was added to human retinal cell lines. These were then irradiated with blue light, and cell death rates were evaluated.

**Human retinal cells**  **No lactobacilli**  **KW lactobacilli**

Cell death rate after blue light irradiation

**Cell death rate suppressed!**
Ingestion of KW lactobacilli improves eye fatigue after digital tasks

25 people suffering from eye fatigue were asked to take capsules that contained or did not contain KW lactobacilli every day for eight weeks, and to perform digital tasks. Eye fatigue after work was compared by using flicker values* as an indicator.

*Limit speed at which progressively faster flashing of light remains perceptible. Fatigue is known to reduce perceptibility.

Source: Nutrients, 2018
Uniqueness and advantages of this technique

Plasma lactobacillus is the only lactobacillus that has been shown to have a positive effect on the eyes.

Unlike conventional approaches, KW lactobacilli are distinguished by their ability to provide support from the inside through their effect on immunity. Only KW lactobacilli have been found to have a positive effect on the eyes.
KW lactobacilli were identified in 2000 in the course of research in the field of immunity, which is one of the Kirin Group's strengths. We have since continued our research on allergy symptoms, and have discovered a novel effect on eye fatigue. Research is continuing in greater depth.

Out of a large number of lactobacilli, KW lactobacilli were found to exhibit the strongest regulating action on the immune imbalance that causes allergies.

**Benefit for allergic conditions**

**Benefit for eye fatigue**
Looking forward, we hope to expand the range of disorders that can be relieved with KW lactobacilli by leveraging their characteristics — namely, the ability to provide care for the retina from the inside and reduce inflammation.