Support for Startup Ecosystem Formation

Adoption year：FY 2022　Principal Investigator：Tokyo Institute of Technology / Assistant Professor / Toshiaki Tanaka　（As of Sep.2022）

Greater Tokyo Innovation Ecosystem

Subject of Research　Startup Project for "Applied Biomatrix"

Overview

Collagen is one of the most valuable component for companies dealing with cosmetics and health food products. Many products exist in the market, which advocate promotion of collagen secretion in the body, however, their functionality remained to be assessed, because a reliable and easy method to quantitate secreted collagen is not available. Also, collagen comprises 30% of total protein in the human body, but we have no way to know its quantity and quality with ease. "Applied Biomatrix" will provide a new service, with which functionality of products promoting collagen secretion is assessed using the "Visualized Collagen System". We will further propose a novel evaluation criteria for health with another new service, which enable customers to check collagen in their body with a non-invasive method. We will create a novel social value contributing to health promotion and presymptomatic disease with maintenance of collagen in the body.
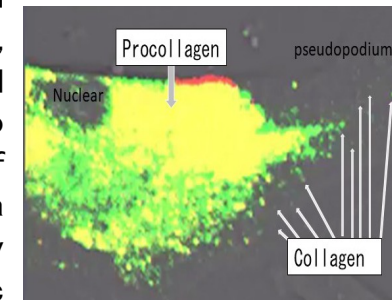
Business Models（when applying）

It has been believed that insertion of a protein tag into type I collagen is impossible, since the tag perturbs collagen structure consisting of the continuous triplet repeat unit of Gly-X-Y. PI of this project Dr. Tanaka succeeded insertion of fluorescent protein tags into type I collagen and constructed the "Visualized Collagen System". Our project operationalizes this system. At first, we will provide a new service, with which functionality of products promoting collagen secretion in the market is assessed with the system. The system may also enables us to develop new products, which functionality is scientifically guaranteed. Based on the knowledge obtained with the system, we are developing markers to quantitate collagen in our body and algorithms to detect its aberration (diagnoses), proposing a novel evaluation criteria for health with examining collagen in the body with a non-invasive method (blood specimen collection).

Activity Planning（when applying）

We are developing reliable and stable system to quantitate the visualized collagen secreted into the cell culture medium in order to assess functionality of products promoting collagen secretion with ease. In concrete terms, we establish stable cell lines expressing the visualized type I collagen (Development Target 1), and find conditions to quantitate GFP-tag of the visualized collagen secreted into the cell culture medium with a conventional microplate reader (Development Target 2). They are organized into a stable system to provide a new service with which functionality of products promoting collagen secretion in the market is assessed, and we conduct business verification of the service. Also, with using secreted-collagen makers developed by the visualized collagen, we establish algorithms to quantitate collagen and to detect its state in the body with a non-invasive method, and collect data relating quantity and state of collagen to age and healthy conditions of customers.