



# Special Feature: Biotechnology for Sustainable and Aging Societies

## Overview

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The latest technology in biological fields, such as genome editing technology and synthetic biology, is progressing rapidly and biotechnology is expected to affect a broad range of industries. In 2030, Japan is likely to face three major challenges: (1) global warming and energy security, (2) aging society, and (3) food security. In combination with IOT, nanotechnology and robot engineering, biotechnology is expected to be an important source of technologies to overcome these challenges.

This special issue focuses on our recent biotechnology research for sustainable and aging societies. In order to build a sustainable society, it is necessary to efficiently produce renewable fuel and plastic from biomass. The major challenge of such production is its cost, and it is particularly important to have a low-cost process for the saccharification of lignocellulose. The first paper describes a novel approach using high-resolution nuclear magnetic resonance in order to understand the complex structure of lignocellulose components. The second and third papers introduce two unique “artificial cellulosome” technologies to convert crystalline cellulose into soluble sugar. Facing an aging society, the prevention and early diagnosis of diseases are required to extend healthy life expectancy and reduce healthcare costs. The fourth paper describes epidemiological research, which is useful for planning and evaluating the programs of prevention, diagnosis and therapy for diseases, as well as health promotion. The final paper introduces a low-cost, multiple detection system for infectious diseases using a unique photo-immobilization technique.