Life Science

Development of Functional Ceramics for the Treatment of Multiple Myeloma

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Purpose of Research

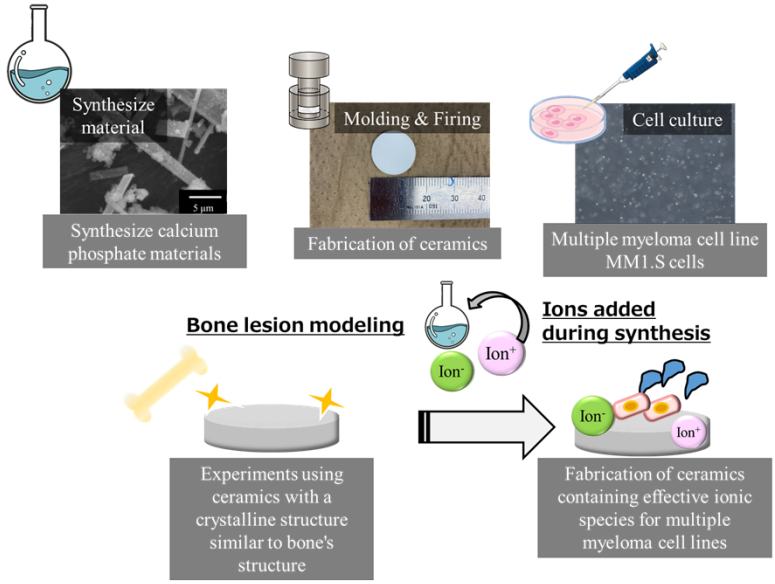
We have been developing ceramics using **calcium phosphate materials**, such as hydroxyapatite, **which are commonly used for materials of bone regeneration.** By applying this technology, we aim to study **how bone disease-related cells interact with the ceramics**, under conditions that **closely mimic the environment inside the human body.**

In this study, we focus on **multiple myeloma**, a disease in which plasma cells in the bone marrow become cancerous and destroy bones. Our goal is to clarify the mechanisms of this disease and to develop new ceramics that contain specific elements capable of regulating cellular activity. Through this approach, we hope to discover **new treatment strategies for bone-related diseases.**

Summary of Research

This study aims to **develop a disease model** by culturing **multiple myeloma cells on ceramics** made from calcium phosphate. And we seek to **recreation the pathological conditions of the disease.** Based on the data obtained from our experiments, we plan to clarify the disease mechanisms. We are also exploring **new materials and their potential applications** in the **treatment of multiple myeloma.** If ceramics containing **specific ions** prove to be effective, clinical application will be considered.

This research is being conducted in collaboration with **"Meiji University"** and **"St. Marianna University School of Medicine".**



Points

- Experimental model that enables recreation and observation of bone disease progression
- Development of effective treatment methods without reliance on pharmaceuticals

Comparison with Conventional or Competitive Technologies

- Enables detailed observation of disease progression in an environment similar to living bone and establishes a new ceramic-based treatment method

Expected Applications

- Development of new treatment methods for multiple myeloma
- Utilization as an experimental model to examine the progression mechanisms of bone diseases

Challenges in Implementation

- Optimization of conditions of cell-culture test for pathological modeling
- Identification of effective ionic species with therapeutic potential, etc.

What We Expect from Companies

- Request for needs related to the application of this research to other diseases

Future Developments

- Optimization of culture conditions for multiple myeloma cells on calcium phosphate-based ceramics
- Evaluation methods for biological responsiveness
- Exploration and application of effective ionic species with potential therapeutic effects

■Contracts : A joint development contract with Meiji University and St. Marianna Univ. School of Medicine
■Patent : Not filed yet
■Prototype : Yes

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