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※弊会記入欄

**（学校用）**

**様式 A-1**

**(FY2023)**

2023年6月8日

# サイエンス・ダイアログ　実施報告書

1. 学校名・実施責任者氏名：千葉県立薬園台高等学校　秋山和哉

2. 講師氏名：Arpna KUMARI

3. 講義補助者氏名：　なし

4. 実施日時：2023年5月26日（金）　13：00　～　14：30

5. 参加生徒：　1年生 15人、　2年生 11人、　3年生 2人（合計 28人）
   備考：（例：理数科の生徒）　普通科の生徒（園芸科は希望者0）

6. 講義題目：Roles of Ribosomal Proteins in the Regulation of Plant Nutrient Deficiency

7. 講義概要：
・研究者になった理由について
・母国（インド）の歴史と研究のための背景、文化等
・インドと日本の関係について
・英語学習と科学学習の関連性について
・研究内容について
・質疑応答
・交流

8. 講義形式：
   ☒対面 ・ □オンライン （どちらか選択ください。）
   1) 講義時間 60分　　質疑応答時間 30分

   2) 講義方法（例：プロジェクター使用による講義、実験・実習の有無など）
   プロジェクター使用による講義

   3) 事前学習
   有
   使用教材 講師の方から共有して頂いた講義スライド、要旨、キーワード集

9. その他特筆すべき事項

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※弊会記入欄

**Form B-2**
**(FY2023)**
**Must be typed**

Date（日付）
29/05/2023 （Date/Month/Year：日/月/年）

# Activity Report -Science Dialogue Program-
**（サイエンス・ダイアログ事業 実施報告書）**

- Fellow's name（講師氏名）: **Arpna Kumari**（ID No. **P22391**）

- Name and title of the accompanying person（講義補助者の職・氏名）**Not applicable (**There was no accompanying person**)**

- Participating school（学校名）: **Chiba Prefectural Yakuendai High School**

- Date （実施日時）: **26/05/2023**（Date/Month/Year:日/月/年）

- Lecture title （講義題目**: Roles of Ribosomal Proteins in the Regulation of Plant Nutrient Deficiency**

- Lecture format（講義形式）:
  - ◆☒Onsite ・ ☐Online (Please choose one.)（対面 ・ オンライン）（（どちらか選択ください。））
  - ◆Lecture time（講義時間） 50 min（分）, Q&A time（質疑応答時間）20 min（分）
  - ◆Lecture style（ex.: used projector, conducted experiments）
    （講義方法（例：プロジェクター使用による講義、実験・実習の有無など））
    used projector and demonstrated how to prepare Agar plates and seed sowing

- Lecture summary（講義概要）: Please summarize your lecture within 200-500 words. [also attached separately]

**Roles of Ribosomal Proteins in the Regulation of Plant Nutrient Deficiency**
**植物の栄養素欠乏の調節におけるリボソームタンパク質の役割**

Arpna Kumari, Toru Fujiwara
Department of Applied Biological Chemistry, Graduate School of Agricultural and Life Sciences, The University of Tokyo, Yayoi, Bunkyo-ku, Tokyo 113-8657, Japan

The population around the world is rapidly growing and is expected to be ~10 billion by 2050. So, fulfilling the increasing global food demands is a matter of concern for the research community, farmers, persons/industries/organizations involved. There are several constraints for limiting crop growth, development and yield including soil nutrient depletion as well as nutrient toxicity due to

overcropping and increased use of agrochemicals, respectively. Plant growth and development is a precisely regulated process at various stages, including mRNA transcription, splicing, stability, and translation. So, the recent advances in microarray, qRT-PCR, and RNA-seq enabled the easy understanding of transcriptional regulation in plants under different biotic and abiotic conditions. However, the stability or function of proteins is not correlated with variations in some gene transcriptional levels. Whereas, the variations in protein composition or activity can directly impact proteomics, allowing plants to respond quickly and reversibly to cellular signals and external stimuli. Therefore, it is essential to unravel the regulatory mechanisms related to translation. The translation (protein synthesis) is mediated by ribosomes, a single ribonucleoprotein complex consisting of two subunits. The large ribosomal subunit is composed of 28S, 5.8S and 5S rRNAs together with 48 ribosomal proteins (RPs), whereas the small subunit is composed of 18S rRNA and 33 RPs. In plants, a mutation in a single RP can impact both the RP's functions and the ribosome's characteristics, leading to ribosomal insufficiency or partial ribosome malfunction, which may cause translation to shift in a variety of ways. Thus, ribosomal proteins' involvement in nutritional translation will reveal the processes and genome-scale role of such control, which may be used to modify plant nutrient responses to achieve sustainable development goals.
So, this lecture covers the introductory background and all the basic methods (media preparation, agar-plate preparation, seed sowing, growth observations and analysis of results) to explore the roles of ribosomal proteins under varying nutrition conditions. Moreover, the students would also be enriched with the knowledge of tools and techniques used for the evaluation of RPs' roles in plant nutrient stress management.
**Keywords:** food security, soil degradation, translational regulation, Arabidopsis.

◆Other noteworthy information（その他特筆すべき事項）:
I really enjoyed the interaction with young minds. Such activities are important for JSPS fellow to understand the education system and Japanese culture. So, I really appreciate this program of JSPS.

- Impressions and comments from the accompanying person（講義補助者の方から、本事業に対する意見・感想等がありましたら、お願いいたします。）: N/A (There was no accompanying person)