

様式 A-1
(FY2023)

2024 年 2 月 26 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: 帝塚山高校 渡邊淳史
2. 講師氏名: Dr. Wildan MUBAROK
3. 講義補助者氏名: Mr. Takashi Kotani
4. 実施日時: 2024 年 2 月 14 日 (水) 13:25 ~ 15:15
5. 参加生徒: 年 生 人、 2 年 生 60 人、 年 生 人 (合計 人)
備考: (例: 理数科の生徒) 女子英数クラスの生徒
6. 講義題目: 3D プリントを駆使して創る複雑な剛性勾配を有する表面を利用した機能的組成の創製
7. 講義概要: 研究内容に関する講義と、わさびから hydrogels を作る実験や 3D プリンタを使用した実演
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 90 分 質疑応答時間 10 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、実験・実演
3) 事前学習
☒ 有 ・ 無 (どちらかに○をしてください。)
使用教材 講師より提示された語彙リストを生徒に事前に提示
9. その他特筆すべき事項:

特記事項なし

Form B-2
(FY2023)
Must be typed

Date (日付)
19/02/2024 (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): Wildan Mubarak (ID No. P22373)

- Name and title of the accompanying person (講義補助者の職・氏名)

学生(博士後期課程 1 年)・粉谷 聖

- Participating school (学校名): Tezukayama High School

- Date (実施日時): 14/02/2024 (Date/Month/Year: 日/月/年)

- Lecture title (講義題目):

Hydrogels for Biomedical Application

- 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) 80 min (分), Q&A time (質疑応答時間) 15 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))

30 min of oral lecture using projector, 50 min of hands-on experiments

- Lecture summary (講義概要): Please summarize your lecture within 200-500 words.

The lecture is titled "Hydrogels for Biomedical Application". In the oral lecture session, a brief introduction of my home country Indonesia, and my research experience in neuroscience and stem cells during my bachelor's and master's degrees were explained. Explanation of hydrogels, what they are, how they were made, the polymers or materials used to make hydrogels, and their application in the biomedical field, including studying the behavior of the cells, delivering medicine, and fabricating artificial organs using the 3D bioprinting technique, was also given during the oral lecture. To help the students better understand the subject given during the lecture and to pique their curiosity, the students participated in two kinds of experiments. Firstly, the students conducted experiments on how to make the hydrogels using 3 methods: using ionic crosslinking of sodium alginate to make hydrogel beads; using horseradish peroxidase enzyme to make hydrogels from alginate modified with phenols; and using the photo-crosslinking technique, where gelation is induced by exposing visible light. The second experiment was on printing liver organs using a 3D printer developed in our laboratory. The lecture was concluded by Q&A in which the students asked excellent questions regarding the basics of the crosslinking technique and 3D bioprinting, as well clinical application of printed organs, to model diseases or for transplantation.

◆Other noteworthy information（その他特筆すべき事項）:

Thanks to the kind assistance of Mr. WATANABE Atsushi and the staff of Tezukayama High School, the lecture can be prepared and conducted smoothly. Our request to be provided with a video camera to make sure that all 60 participating students can see the experiments; as well as nitrile gloves and lab coats to ensure the safety of the students during experiments helped the lecture to go well and safely.

Considering the numerous technical terminology from biology, chemistry, and physics, used in the lecture, as well as the interdisciplinary nature of the research, the students could understand very well and have a high interest in the subject. We were impressed with the excellent questions from the students both during the Q&A session as well as their follow-up questions after the lecture ended.

- 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。）:

講義補助者として、このような貴重な体験をさせていただき大変感謝しております。発表、実験体験、質疑応答が組み合わさることによって双方向的なコミュニケーションが行え、理想的なアウトリーチ活動になっていると感じました。

