SD4668
（学校用）

様式 A-1
(FY2025)

2025年10月9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: 山梨県立日川高等学校　風間　栄一

2. 講師氏名: Dr. Muhamad Adnan SABAR (Mr.)

3. 講義補助者氏名: 原本　英司　先生

4. 実施日時: 2025年　10月　9日（　木　）　14:00　～　15:40

5. 参加生徒:　2年生　40人、　1年生　40人、　　年生　　人（合計　80人）
   備考:（例:理数科の生徒）　SSH クラスの1年次生、2年次生

6. 講義題目: Spread and Control of Antibiotic Resistant Bacteria in Water Environment
   水環境中の薬剤耐性菌の拡散と制御

7. 講義概要:

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　80 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

   3) 事前学習
   ☑有 ・ 無 （どちらかに〇をしてください。）
   使用教材　講師から事前に送られてきたワークシートとハンドアウト そしてパワーポイント

9. その他特筆すべき事項:

・事前学習用ワークシートの構成。
・具体的な事前指示。
・頻繁な連絡のやりとり。
・一般的な高校生の授業参加の特徴を熟知していたこと。

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※弊会記入欄

Form B-2
(FY2025)
Must be typed

Date（日付）
10/10/2025 （Date/Month/Year：日/月/年）

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

- Fellow's name（講師氏名）: Muhammad Adnan SABAR （ID No. P24393 ）

- Name and title of the lecture assistant（講義補助者の職・氏名）
Prof. Eiji HARAMOTO

- Participating school（学校名）: Yamanashi Prefectural Hikawa Senior High School

- Date （実施日時）: 9/10/2025 （Date/Month/Year：日/月/年）

- Lecture title（講義題目）:
Spread and Control of Antibiotic Resistant Bacteria in Water Environment

- 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） 10 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 a projector and brought influent and effluent water samples from the WWTP

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

This lecture addressed antimicrobial resistance (AMR), one of the most critical global health challenges of our time. Beginning with a personal introduction about my background, motivation for becoming a scientist, and home country, I aimed to connect with students while establishing the global nature of this issue.

The presentation commenced by highlighting the severity of AMR, which currently causes approximately 700,000 deaths annually worldwide, with projections reaching 10 million deaths by 2050 if left unaddressed. I then introduced students to the fundamentals of antibiotics, starting with Alexander Fleming's discovery of penicillin in 1928, and explained how different antibiotic classes work through distinct mechanisms: β-lactams disrupt bacterial cell wall synthesis, quinolones inhibit DNA replication, and aminoglycosides interfere with protein synthesis. The lecture then explored how bacteria develop resistance and transform into "superbugs" through three primary mechanisms: efflux pumps that expel antibiotics, enzymatic degradation of drugs, and mutations in target sites.

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A significant portion of the presentation focused on wastewater's critical role in AMR dissemination, emphasizing the "One Health" concept that connects human, animal, and environmental health. I explained how wastewater treatment plants (WWTPs) help mitigate AMR spread by reducing bacterial loads before releasing water into the environment. However, I also shared my original research findings on AMR in wastewater and environmental waters including combined sewer overflows (CSOs) during rainfall events significantly impact AMR profiles in urban rivers.
The presentation concluded by inspiring students to recognize their potential role in addressing this global challenge. I emphasized how scientific research in this field directly benefits humanity worldwide and encouraged students to consider contributing to the fight against AMR, connecting molecular biology concepts with real-world environmental and public health applications.

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

Everyone at the school, including teachers and staff, were very welcoming and helpful. The students were interested in learning about antimicrobial resistance, stayed focused and engaged throughout the talk, and made the Q&A section lively and interesting.

- Impressions and comments from the lecture assistant（講義補助者の方から、本プログラムに対する意見・感想等がありましたら、お願いいたします。）:

At the end of the lecture, Prof. Haramoto said it was a good experience and complimented my presentation for being both informative and engaging.