

様式 A-1

2025年6月10日

サイエンス・ダイアログ 実施報告書

1. 学校名：兵庫県立神戸高等学校
2. 講師氏名：Dr. Lutan LIU
3. 講義補助者氏名：Shuntaro TAKAHASHI; Hisae TATEISHI
4. 実施日時：2025年6月8日（月）15:00～17:00
5. 参加生徒：1年生0人、2年生39人、3年生0人（合計39人）
備考：総合理学科の生徒
6. 講義題目：DNA Structure and Function

7. 講義概要：

DNA is known as the molecule that stores hereditary information in our cells. The genetic code written as a sequence of DNA bases is translated into a variety of proteins that maintain bodily functions and keep us alive. In addition, DNA sequences control when and where each protein is expressed. One strategy DNA uses to regulate protein expression involves changes in its structure. The likelihood that DNA will fold into a particular structure depends on its stability relative to other possible structures. This lecture will describe the basics of DNA structure and function, as well as the importance of structural stability. The lecture will also introduce some facts about Canadian culture.

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 100分 質疑応答時間 20分

2) 講義方法

プロジェクター使用による講義、実習(DNA カードゲーム)による学習

3) 事前学習

☒有 ・ ☐ 無

使用教材：

事前学習資料①～④をご参照ください。

9. その他特筆すべき事項：

Form B-2

Date (日付) 15/06/2026

(Date/Month/Year: 日/月/年)

Must be typed

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

1. Fellow's name (講師氏名): Lutan LIU (ID No.P25352)

2. Name and title of the lecture assistant (講義補助者の職・氏名): Dr. Lutan LIU

3. Participating school (学校名): Hyogo Prefectural Kobe High School,

4. Date (実施日時): 08/06/2026

5. 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): 100 min (分), Q&A time (質疑応答時間): 20 min (分)

◆Lecture style (e.g., 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))

I used a projector to give a power point presentation. Then, we played a card game that uses important concepts in my research

6. Lecture title (講義題目):

DNA: Exploring the Structure and Function of the Molecule of Life

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

The lecture was designed to introduce high school students to the basic functions of DNA in our bodies and the mechanisms of its action.

In the first part of the lecture, I described several facts about Canadian culture, including its geography, cuisine, scenery, sports, and scientific contributions, making occasional comparisons to Japan. I also shared my own cultural background and the motivation behind my career path.

In the second part of the lecture, I discussed the structure and function of DNA in our cells. DNA is known as the molecule that stores hereditary information. The genetic code written in DNA sequences is translated into a variety of proteins that maintain bodily functions. In addition, DNA sequences control when and where each protein is expressed. Our individual diversity originates from differences in protein expression caused by variations in our genes. One strategy DNA uses to regulate the timing and location of protein expression involves conformational changes between canonical and noncanonical structures. The likelihood of DNA folding into a particular

structure depends on its stability relative to other possible structures. The students were introduced to the concept of the Gibbs free energy parameter (ΔG), which is commonly used to measure the stability of a chemical compound, including nucleic acids. I also showed the students how to calculate the ΔG of DNA double strands using Nearest Neighbor parameters. Finally, I connected this concept of stability to my current research project, which characterizes the stability contributions by several structural and environmental factors to DNA and RNA duplexes.

Following the talks, I had the students play a DNA card game in groups of five or six people. The object of the game was to build the most stable DNA strand using the bases in the deck. Through this activity, the students practiced calculating ΔG using Nearest Neighbor parameters. I also challenged the students to think about why certain nearest neighbor pairs are more stable than others.

The lecture concluded with a 20-minute Q&A session. During this time, the students freely asked questions about both my background and DNA.

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

9. 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。):

"Canadian" Food



Maple Syrup



Maple Taffy
[Maple candy
made on snow]

減しゴミカスは
集めてゴミ箱へ
捨ててください

