令和 6 年 12 月 23 日

サイエンス・ダイアログ 実施報告書

- 学校名・実施責任者氏名: <u>千葉市立千葉高等学校・坂巻 諒一</u>
- 2. 講師氏名: Baptiste Alric. (Mr.)
- 3. 講義補助者氏名:_____ 中田 健吾 様
- 4. 実施日時: 令和 6 年 12 月 23 日 (月) 14:00 ~ 15:30
- 5. 参加生徒: <u>1</u>年生 <u>38</u>人、 <u>2</u>年生 <u>42</u>人、 <u>3</u>年生 <u>0</u>人(合計 <u>80</u>人) 備考:理数科の生徒、普通科SSHコースの生徒、WSCプログラムの生徒
- 6. 講義題目: <u>Exploring Biophysics and Organ-on-Chip Technology</u>
- 7. 講義概要:グリンパティッククリアランス血液脳関門チップ:メカニズムと脳疾患への影響
- 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、顕微鏡を使用した生徒体験型の実験
 - 3) 事前学習
 有・無(どちらかにOをしてください。)
 使用教材 講師からの講演要旨・英単語リスト・参考ビデオ、本校サイエンスアシスタントによる1週間前の事前講義
- 9. その他特筆すべき事項:

特にありません

Form B-2 (FY2024) Must be typed Date (日付) <u>26/12/2024 (Date/Month/Year:日/月/年)</u>

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):ALRIC Baptiste <u>(ID No.</u> P24710_)

- Name and title of the lecture assistant(講義補助者の職・氏名) Kengo Nakata, Master student

- Participating school (学校名): <u>千葉市立千葉高等学校 (Chiba Municipal Chiba High School)</u>

- Date (実施日時):<u>23/12/2024 (Date/Month/Year:日/月/年)</u>

- Lecture title (講義題目):

Exploring Biophysics and Organ-on-Chip Technology

- 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)_60 min(分), Q&A time(質疑応答時間)_30 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))

<u>Projection de slide in english and japanes, then experiment also projected on a screen</u> - Lecture summary (講義概要): Please summarize your lecture within 200-500 words.

The lecture focused on my personal research journey, current projects, and the significance of my work. I am a biophysicist conducting research at the University of Tokyo, within the LIMMS-CNRS/IIS, a French research institute based at the Institute of Industrial Science. After completing my PhD in France, I moved to Japan to further my research, which merges biology and physics.

I began the lecture by discussing my PhD research on how mechanical forces impact cell growth. I explained how cells generate these forces when confined and demonstrated that these forces can lead to a decrease in cell growth. This example illustrated the role of biophysics in understanding biological mechanisms and how studying physics within cells can provide deeper insights into biological processes. I also described how my research involves developing innovative micro- and nanosystems to study these biological phenomena.

A key aspect of my current work in Japan is the creation of organ-on-chip technology—tiny models of human organs built on small plastic chips. These chips allow researchers to study organ functions, disease progression, and drug effects in a more ethical and precise way than traditional animal or human experiments. I then delved into my current project, which focuses on building micro blood vessels on these chips. Blood vessels are essential for transporting oxygen and nutrients throughout the body, making them critical for organ function. My research specifically targets blood vessels that are approximately 200 micrometers in diameter, comparable to the size of a fine grain of sand. The importance of this work lies in its potential applications. Better organ-on-chip models can accelerate research into diseases like cancer and cardiovascular disorders, offering safer, faster, and more effective testing for treatments. By fine-tuning these systems, we can improve their quality and reliability, leading to advancements in biomedical research.

Finally, I during my lecture, I discussed my academic journey, the motivations that led me to pursue research in Japan, and the broader impact of organ-on-chip technology on biomedical science. The goal of my lecture was to highlight the significance of this emerging field and the exciting possibilities it offers for advancing healthcare.

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

I want to salute the help and participation of all the personnel involved in the installation, the motivation of the students, and the high school staff during the Q&A and the experiment.

- 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。):

