

(For JSPS Fellow)

Form B-5

Date (日付)

01.09.2015

(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): Duncan McMillan (ID No. P14383)- Participating school (学校名): Fukushima High School- Date (実施日時): 21.08.2015 (Date/Month/Year: 日/月/年)- Lecture title (講演題目): Energy and Lifeエネルギーと生命

- Lecture summary (講演概要): Please summary your lecture 200-500 words.

My research is the study of how life adapts/changes to live in different environments. I explained how the most important thing that is needed to do this is to make chemical energy (ATP) and how this process uses the food we eat in combination with the reduction of oxygen. This was demonstrated experimentally using fire and burning potato chips. I explained that when breathing oxygen, these processes needed to make most ATP are located in the cell membrane. When then discussed this in terms of where these processes are located animal cells. When then discussed bacteria and how sometimes the environment is very difficult to survive in due to severe conditions (i.e. high temperature and alkaline environments) and it is difficult to make chemical energy (ATP), so the bacteria use special ways of doing this. This involves the proteins in the cell membrane being isolated, and studied using electricity, single-molecule microscopy and nanotechnology approaches. I explained I study how these bacteria do this by using advanced artificial membrane technologies and how this has taken me across the world, from New Zealand to the United Kingdom, to Germany and now to Japan. Real data was shown alongside practical demonstration to reinforce important points. Volunteers from the class were then asked to demonstrate the principles of how these enzymes might work together by acting as enzymes performing an enzyme role.

- Language used (使用言語): English

- Lecture format (講演形式):

◆Lecture time (講演時間) 45 min (分), Q&A time (質疑応答時間) 15 min (分)

◆Lecture style (ex.: used projector, conducted experiments)

(講演方法 (例: プロジェクター使用による講演、実験・実習の有無など))

Used Projector with powerpoint, conducted experiments, used original props and performed demonstrations involving student participation

Must be typed

◆ Interpretation (ex.: assistance by accompanied person, provided Japanese explanation by yourself) (通訳 (例: 同行者によるサポート、講師本人による日本語説明))

No interpretation required _____

◆ Name and title of accompanied person (同行者 職・氏名)

Not applicable _____

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

- Impressions and opinions from accompanied person (同行者の方から、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。):