

(For JSPS Fellow)

Form B-5

Date (日付) 28/02/2013

(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): Felix E. BUCHERT (ID No. P 12389)

- Participating school (学校名): Takezono High School, Ibaraki Prefecture

- Date (実施日時): 26/02/2013 (Date/Month/Year: 日/月/年)

- Lecture title (講演題目): (in English) THE AIR WE BREATHE – CONSEQUENCES OF
OXYGENIC PHOTOSYNTHESIS

(in Japanese)

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

see next page

- Language used (使用言語): English

- Lecture format (講演形式): PowerPoint presentation

◆Lecture time (講演時間) 30 min (分), Q&A time (質疑応答時間) 7 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 and black board, at the end of the talk the experiment was conducted

◆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))

assistance by accompanied person

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

Mr. Yu TSUKAMOTO, M.Sc. student

◆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。):

(For JSPS Fellow)

Form B-5 (continued)

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

After being introduced by Ms. Yukiko Shigenaga, I started the lecture with a couple of introductory slides about me and where I am from. The theoretical part followed, beginning with the history of our planet. I wanted the students to realize that evolution of photosynthesis occurred very early. The next part of my talk mainly dealt with the importance of getting enough energy, starting with chemosynthesis as an early mechanism to survive. I drew the attention on photosynthesis, outlining that light perception had to be evolved. The next part mainly involved the light reaction of photosynthesis, emphasizing that light energy has to be transformed into other forms of energy for short-term storage, namely ATP and reducing power. On this occasion I spent some time highlighting the ATP synthase - the enzyme I am working with. After having explained that carbon dioxide is also needed for synthesis of macromolecules, I explained that oxygenic photosynthesis changed life on this planet tremendously. I concentrated on the production of reactive oxygen - the other topic my research focuses on - and its detoxification within the cell in order to tolerate an oxygenic atmosphere. In the last part of my talk, the benefits of using oxygen during respiration were explained. Due to the high amount of ATP produced in the mitochondria by using oxygen for burning foodstuff, sophisticated complexity and phenomena of life could evolve. One example was given in the experiment demonstrating bioluminescence. This is a reaction in bacteria, animals and fungi that produces light by consuming ATP and oxygen. Small reaction tubes were handed out in a darkened room and the students could observe glowing of the tube after adding ATP solution.