

(For JSPS Fellow)

Form B-5

Date (日付)

20/09/2013 (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): Takahashi Tomio (ID No. PE13029)
- Participating school (学校名): Fukushima Prefectural Fukushima High School
- Date (実施日時): 13/09/2013 (Date/Month/Year: 日/月/年)
- Lecture title (講演題目): Resolution of the 3D structure of proteins involved in DNA damage repair using X-ray diffraction of protein crystal
- Lecture summary (講演概要): Please summary your lecture 200-500 words.  
The cell is the basic structural, functional and biological unit of all known living organisms, from bacteria to human. All of our cells contain lipidic membranes, nucleic acids (DNA and RNA), and proteins.  
The DNA molecules contain all the genetic information, and its integrity is critical for the correct function of the cell. DNA integrity is continuously challenged by exogenous and endogenously generated DNA-damaging chemicals, ionizing radiation and ultraviolet radiation, and by errors in DNA replication. As a consequence, cells have evolved numerous mechanisms to deal with these lesions, including DNA repair machineries. A lot of proteins have been identified so far as main actors in the repair of DNA Damage, thanks to both medical and fundamental research results.  
These proteins are often defective in tumoral cells of patients with cancer, and genetic abnormalities in these proteins can be associated with cancer predisposition as well as other genetic diseases. Understanding DNA repair mechanisms is also important since cancer treatment mainly utilizes DNA damaging agents (radiotherapy and chemotherapy).  
My project in Japan is to visualize the structure of proteins involved in the repair of DNA damage, using X-ray diffraction of protein crystals. This is achieved through four different steps, including cloning step (engineering bacteria to overexpress one protein), purification step (isolating the protein in a solution as pure as possible), crystallisation (slowly removing water molecules from the solution to obtain crystal), and crystal analysis through X ray diffraction pattern, which should give atomic resolution of the protein structure.  
During this presentation, I will give a brief description of the routine experiments carried in crystallographic laboratory, and stress how stubbornness is an essential quality for this job.
- Language used (使用言語): English

- Lecture format (講演形式):

◆Lecture time (講演時間) 60 min (分), Q&A time (質疑応答時間) 30min (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))

Powerpoint presentation \_\_\_\_\_

◆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))

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

◆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。):