

Form B-2  
(FY2022)  
Must be typed

Date (日付)  
2022 11 21 (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): Michael Country (ID No. P20758)
- Name and title of the lecture assistant (講義補助者の職・氏名)  
中尾 肇 (Hajime NAKAO)
- Participating school (学校名): 兵庫県立神戸高等学校 (Hyogo Prefectural Kobe High School)
- Date (実施日時): 2022 11 15 (Date/Month/Year: 日/月/年)
- Lecture title (講義題目):  
Mysteries of metabolism in the **retina** and in **hibernation**
- 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) 70 min (分), Q&A time (質疑応答時間) 20 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))  
Powerpoint, projector, microphone
- Lecture summary (講義概要): Please summarize your lecture within 200-500 words.

My name is Michael Country, and I am a Canadian scientist working at RIKEN, Japan. My research is about metabolism, which is the study of how cells get energy to survive. In this talk, I'll discuss the benefits of studying and working abroad. I'll give a couple tips to improve your English. I'll also discuss three of my favourite research projects. First, in Canada, I studied goldfish eyes. Goldfish can survive for hours without oxygen. This is amazing, right? If humans could do this, we wouldn't die from heart attacks or strokes. I studied goldfish metabolism in the retina, which is the neural tissue in the back of the eye that lets you see. I showed that mitochondria sense when oxygen is low, and they keep  $Ca^{2+}$  low to avoid cell death. Secondly, I collaborated with a friend in Denmark to compare blood supply in animal eyes. The retina needs to get blood for energy. But it also needs to be transparent, and blood is dark so it prevents light from entering. How can you get oxygen to the eye without blood vessels? We named this problem the "opto-respiratory showed how fish, reptiles, birds, and mammals solve this problem, and we named this the opto-respiratory compromise (opto- means "light").

## SD

※弊会記入欄

And lastly, in America and Japan, I have been studying how animals hibernate. We know the brain starts the process of hibernation. But after it starts in that one part of the brain (the hypothalamus), what is the next step? Does the brain cause a hormone to be released into the blood? Or does it change brain activity in the rest of the brain, kind of like how we sleep? I'll describe an experiment I'm doing to learn how animals hibernate. If we answer this question, maybe we can make humans hibernate too, which could save lives during heart attacks, strokes, and organ transplantation.

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

N/A

- Impressions and comments from the lecture assistant (講義補助者の方から、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。):