MINDS-ON: Introduction to Andre’s Case

Purpose:
- To set the stage for the exploration of the science and ethics surrounding the use of multipotent and pluripotent stem cells to treat type 1 diabetes
- To construct new knowledge about diabetes which will form the foundation for learning about how stem cells can be used to treat diabetes in the future

Overview:
In this group of introductory activities, students will become familiar with the fictional story of Andre, a teenage boy with type I diabetes, as well as learn/review information about diabetes using a Print-Video Venn Diagram learning strategy.

Suggested Timing:
- Part 1: 10-15 minutes
- Part 2: 20-30 minutes

Prior Knowledge and Skills:
- Able to work collaboratively in small groups
- Able to take notes while viewing a video

Materials:
- BLM M1: Andre’s Story [pdf] – 1 per student
- BLM M2: Diabetes Backgrounder [pdf] – 1 per student
- BLM M3: Print-video Venn Diagram [doc] [pdf] – 1 per student
- Video or animation. Some good sources of videos and animations include:
  - Insulin Production and Type 1 Diabetes (Accessed April 24, 2014)
    This video (4:12 min.), from the Walter and Eliza Hall, has an animation explaining the process of glucose regulation as well as the development of type 1 diabetes.
  - Diabetes Made Simple (Accessed May 14, 2014)
    This video (4:00 min.) has a simple explanation of what diabetes is, complications that can arise from it, and ways to manage it.
  - What is Type 1 Diabetes? (Accessed May 14, 2014)
    This video (2:14 min.) from ClearlyHealth, explains what occurs to people with Type 1 Diabetes.

Instructions:
Part 1: Andre’s Story
- Have the students read BLM M1: Andre’s Story and individually write their reactions to the story at the bottom of the page. Students who wish to share their reactions with the class may do so and those who do not may keep them as personal reflections. These pages will be revisited.
- Have the students identify dilemmas that they encountered in the story. This could include the science dilemma (which research to fund: adult multipotent stem cells or embryonic pluripotent stem cells to treat type 1 diabetes?) as well as ethical dilemmas (which source of stem cells: donated organs or embryos?).
The students may come up with a number of dilemmas. It is up to you which you wish the class to focus on.

Part 2: Learning about Type 1 Diabetes
- Before reading and viewing, have students activate their prior knowledge by answering questions (either on paper or orally), such as:
  - What do I already know about diabetes?
  - Do I have a personal experience that I can connect to this topic?
- Provide guiding questions to focus the reading and viewing, such as:
  - What is type 1 diabetes?
  - What causes diabetes?
  - What is the current treatment for type 1 diabetes?
- Provide students with the BLM M2: Diabetes Backgrounder. As students view or read the information, they can use strategies (Assist) such as:
  - Re-reading
  - Visualizing what is happening
  - Searching for connections within the text and from the text to self
  - Taking notes about key points
- Have students watch a video or animation of your choice. Ensure that students have a place to record point form notes during the video (e.g., in a notebook).
- Provide students with the BLM M3: Print-video Venn Diagram. On the left side, have the students record information unique to the text, on the right side record information unique to the video, and in the centre, record information common to both the text and the video.
- Bring students together in small groups to reflect on their understanding of type 1 diabetes. Each group should create a collaborative list of key points as well as questions about any information or terminology that they do not understand.
- Have each group share its key points and create a class list of key points. Encourage the students to add to and revise other group’s points as well as answer questions posed by other students.

Connecting to Other Resources on CurioCity:
- **What is Glucose For?**
  This article (2009) explains the function of glucose and why sometimes people get a ‘sugar-high.’
- **Diabetes Prevention Worker, Southwest Ontario Aboriginal Health Access Centre (SOAHAC)**
  This career profile is of a woman whose job is to help prevent diabetes by creating awareness and promoting healthy living.

Extensions:
- Students could compare and contrast type 1 diabetes with type 2 diabetes in terms of causes, symptoms, etc.

Assessment Suggestions:
- Venn-diagrams can be assessed for student understanding and to identify misconceptions about diabetes.
Additional Information:

- **Canadian Diabetes Association** (Accessed Oct. 16, 2014)
The Canadian Diabetes Association website has general information about diabetes as well as information about current diabetes research.

- **Juvenile Diabetes Research Foundation Canada** (Accessed Oct. 16, 2014)
The Juvenile Diabetes Research Foundation is dedicated to finding a cure for type 1 diabetes. On their website you can find out about research as well as how to get involved.

- **Pancreatic Islet Transplantation** (Accessed Oct. 16, 2014)
This PDF from the US National Diabetes Information Clearinghouse explains the function of pancreatic islets, the process of islet transplantation, the risks and benefits of the procedure as well as issues related to the shortage of islets.

In this video (2013, 2:42 min.) from the CBC archives, Medical researchers at the University of Alberta speak to the media about their ground breaking work known as the Edmonton Protocol.

- **National Diabetes Information Clearinghouse (USA)** (Accessed Oct. 16, 2014)
This section of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) has extensive information about diabetes including treatments, complications, research reports and more. It also has a link to the National Diabetes Education Program.