

## Small TLEF Project – Final Report

Report Completion Date: (2017/11/14)

### 1. PROJECT OVERVIEW

#### 1.1. General Information

|                                 |   |                                 |                |
|---------------------------------|---|---------------------------------|----------------|
| <b>Project Title:</b>           | Project M.I.L.E - Microbiology & Immunology Laboratory Experience: A Comprehensive Web-Based Resource for Microbiology Laboratories |                                 |                |
| <b>Principal Investigator:</b>  | Shervin Mortazavi (faculty sponsor Dr. David Oliver)  |                                 |                |
| <b>Report Submitted By:</b>     | Shervin Mortazavi / Dr. David Oliver  |                                 |                |
| <b>Project Initiation Date:</b> | March 8 <sup>th</sup> , 2016  | <b>Project Completion Date:</b> | August 31 2017 |

#### 1.2. Project Summary

This project aims to develop a web-based instructional resource for undergraduates in microbiology laboratories. An easy to navigate interface will guide students to a variety of topics, such as scientific writing, safety information, proper lab etiquette, as well as individual experimental techniques. Each topic will consist of videos and visual/text-based guides specifically produced for the project. This unified design will streamline laboratory information and make for a more cohesive and intuitive learning experience where students can conveniently access and review instructions and materials as often as desired. The project relies on the two fundamental design strategies of Students as Producers and Peer Learning. The collaboration of students on the project design and content production teams will ensure the site to be more practical and relevant to the needs of the students in Microbiology and Immunology. Initial funding will help to establish the modules, design the sitemap, develop the website architecture as well produce a preliminary set of videos.

**1.3. Team Members** – (Please fill in the following table and include students, undergraduate or graduate, who participated in your project).

| Name              | Title/Affiliation | Responsibilities/Roles            |
|-------------------|-------------------|-----------------------------------|
| Shervin Mortazavi | M&I undergrad     | Principle Applicant / Sr. Advisor |
| Kirstin Brown     | M&I grad          | Sr. Advisor / JEMI Editor         |
| Andrew Santos     | M&I grad          | Project Worker / Team Leader      |
| Rozlyn Boutin     | M&I grad          | JEMI Editor                       |
| Sarah Woodward    | M&I grad          | Project Worker / Team Leader      |
| Blair Hardman     | M&I undergrad     | Producer / Video Creation         |
| David Hunt        | M&I undergrad     | Producer / Video Creation         |
| Aaron Naor        | M&I undergrad     | Producer / Video Creation         |
| Carys Croft       | M&I undergrad     | Producer / Video Creation         |
| Kevin Ng          | M&I undergrad     | Producer / Video Creation         |



|                 |               |                           |
|-----------------|---------------|---------------------------|
| Jordan Chiu     | M&I undergrad | Producer / Video Creation |
| Arnab Ray       | M&I undergrad | Producer / Video Creation |
| Thomas Tsui     | M&I undergrad | Producer / Video Creation |
| Benson Chang    | M&I undergrad | Producer / Video Creation |
| James Wang      | M&I undergrad | Author                    |
| Michael Woo     | M&I undergrad | Author                    |
| Chris Yan       | M&I undergrad | Author                    |
| Angela Chan     | M&I undergrad | Author                    |
| Julius Landas   | M&I undergrad | Author                    |
| Yvonne Pang     | M&I undergrad | Author                    |
| Freddy Francis  | M&I undergrad | Author                    |
| Rachel Miller   | M&I undergrad | Author                    |
| Manveer Nagra   | M&I undergrad | Author                    |
| Tom Ji          | M&I undergrad | Author                    |
| Aneka Lu        | M&I undergrad | Author                    |
| Kaylee Wu       | M&I undergrad | Author                    |
| Frances Perry   | M&I undergrad | Grant Co-writer/Advisor   |
| Cheryl Wu       | M&I undergrad | Grant Co-writer/Advisor   |
| Armin Mortazavi | UBC Alumni    | Grant Co-writer/Advisor   |
| Nicole Mar      | M&I undergrad | Grant Co-writer/Advisor   |
| Faraz Bateni    | M&I undergrad | Grant Co-writer/Advisor   |
| Milo Yu         | M&I undergrad | Grant Co-writer/Advisor   |
| Ariel Huang     | M&I undergrad | Grant Co-writer/Advisor   |
| Eva Luan        | M&I undergrad | Grant Co-writer/Advisor   |
| Jessica Que     | M&I undergrad | Grant Co-writer/Advisor   |

**1.4. Courses Reached** – Please fill in the following table with ***past***, ***current***, and ***future*** courses and sections (e.g. HIST 101, 002, 2017/2018, Sep) that have been/will be reached by your project, including courses not included in your original proposal (you may adapt this section to the context of your project as necessary).

| Course   | Section | Academic Year | Term (Summer/Fall/Winter) |
|----------|---------|---------------|---------------------------|
| MICB 447 |         | 17WT1 onward  | Fall                      |
| MICB 421 |         | 17WT2 onward  | Winter                    |
| MICB 322 |         | 17WT1 onward  | Fall                      |
| MICB 323 |         | 17WT2 onward  | Winter                    |
|          |         |               |                           |
|          |         |               |                           |
|          |         |               |                           |
|          |         |               |                           |
|          |         |               |                           |
|          |         |               |                           |

## 2. OUTPUTS AND/OR PRODUCTS

2.1. Please **list** project outputs and/or products (e.g. resources, infrastructure, new courses/programs). Indicate the current location of such products and provide a URL if applicable.

| Product(s)/Achievement(s):                 | Location:   |
|--|---|
| JEMI-methods journal / articles and videos | <a href="https://jemi.microbiology.ubc.ca/jemi_methods_papers">https://jemi.microbiology.ubc.ca/jemi_methods_papers</a> |
|  |   |
|  |   |
|  |   |

2.2. **Item(s) Not Met** – Please list intended project outputs and/or products that were not attained and the reason(s) for this.

| Item(s) Not Met: | Reason: |
|------------------|---------|
| None             |         |
|                  |         |

## 3. PROJECT IMPACT

3.1. **What were you hoping to change or where were you hoping to see an impact with this project?** – Please list the intended benefits of the project for students, TAs, instructors and/or community members.

The goal of this project was to generate a technical video-based resource that would support our undergraduate students as they learn to work in the microbiology laboratory. While the initial intent was to contract a team to build a library of “how to” videos it was later decided that the project would have more value to students if they created and published “how to” videos each term during our capstone research courses (MICB 447 and MICB 421). We found that paper-based articles were the preferred modes of communication for some students so we introduced that as an option. Going forward, the paper based articles will serve a “scripts” for technical videos, thereby linking the review process creating efficiencies and driving quality. The benefits include of this project include:

- A video based resource to support early stage researchers
- A course-based assignment in which undergrads create and publish videos and articles. The effort invested in creating this educational product produced a framework for a course-based assignment where students are continuing to contribute to JEMI-methods. This is currently underway in MICB 447 / 17WT1.
- A teaching resource for instructors
- An open access instructional resource for the wider scientific community
- This video has been viewed >60,000 times on YouTube

<https://jemi.microbiology.ubc.ca/node/158>



**3.2. Were these changes/impacts achieved? How do you know they occurred?** – *To what extent were intended benefits achieved or not achieved? What evaluation strategies were used? How was data collected and analyzed? You are encouraged to include copies of data collection tools (e.g. surveys and interview protocols) as well as graphical representations of data and/or scenarios or quotes to represent and illustrate key themes.*

- **The open access articles and videos are posted here: [jemi.microbiology.ubc.ca](http://jemi.microbiology.ubc.ca)**
- **Traffic to the website is tracked using Google analytics**
- **YouTube views are available**
- **Students in our lab courses have been using these videos this term**

**3.3. Dissemination** – *Please provide a list of **past** and **upcoming** scholarly activities (e.g. publications, presentations, invited talks, etc.) in which you or anyone from your team have shared information regarding this project.*

- Mortazavi, S., Santos, A., Woodward, S., Brown, K and DC Oliver **JEMI –Methods**. 2017 TLEF Showcase as part of Celebrate Learning Week.
  - [Link to poster](#)
- Woodward, S., Santos, A., Mortazavi, S., Brown, K. **JEMI-Methods: Creating a self-sufficient student-run instructional video series**. UBC Writing Across the Curriculum Roundtable Symposium, at the CTLT Spring Institute May 2017.

*We will introduce JEMI-Methods, a new arm of UBC's Journal of Experimental Microbiology and Immunology (JEMI), featuring student-made videos that break down scientific techniques into their theory and applications, and provides visual demonstrations of technique performance. JEMI-Methods will develop into a student-led initiative, with student teams writing methods protocols, producing videos, and publishing them as instructional tools for their peers. Here we will share a completed video, our step-by-step breakdown of the video-making process, and our experience guiding student teams throughout the developmental process. We will highlight the challenges we faced, and suggestions to educators wishing to implement similar programs within their departments.*

- Brown, K, Ramey, WD, Jean, F, and DC Oliver. **JEMI 2.0 – An Online Active-Learning Platform Engaging Undergraduate Students, Graduate Students, and Post-Doctoral around the World Fellows around the World**. Canadian Society of Microbiologists Annual General Meeting. Toronto, 2016.

*Presentation included a brief introduction to JEMI-methods.*



**TEACHING PRACTICES** – Please indicate if **your** teaching practices or those of **others** have changed as a result of your project. If so, in what ways? Do you see these changes as sustainable over time? Why or why not?

- This project has impacted my (Dr. Oliver's) teaching practices in the following ways:
  - The technical resource has become a useful tool in my undergraduate research course. It has certainly made teaching basic skills more efficient.
  - Guiding students through the process of developing publishable videos has identified areas of common misconception related to scientific concepts. This knowledge has allowed me to target improvement to specific aspects of my course.
  - The project developed the framework for a course-based project in which students continue to build content. This is a high value learning experience for the student authors/producers who engage in metacognitive activities as they think about how to effectively communicate complex skills to varied audiences.

**4. PROJECT SUSTAINMENT** – Please describe the sustainment strategy for the project components. How will this be sustained and potentially expanded (e.g. over the next five years). What challenges do you foresee for achieving the expected long-term impacts listed above?

- JEMI-methods will continue to grow as MICB 447 and MICB 421 undergraduate students continue to contribute articles and videos. We intend to publish lessons learned while building this journal which will disseminate our ideas and effectively market the journal to a wider audience. As it is now part of a course, the JEMI-methods initiative is essentially self-sustaining and is expected to grow without direct monetary investment.