

## PULSE EXPERIENTIAL TEAM ASSIGNMENT

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| <b>Team #: 42</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <p><b>1. Title of your PULSE experiential assignment.</b><br/> <i>Provide a creative and informative title.</i></p> <p>HPV and Cervical Cancer: How a Viral Infection Becomes Cancer</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p><b>2. Please summarize your PULSE experiential assignment (max 300 words).</b><br/> <i>Provide a non-technical (lay) summary of your PULSE assignment. Prompts to think about: What is the topic? What is the format? Why did you choose this topic and format? The summary for lay audience is a brief and accessible summary of the assignment that is used to explain complex ideas, technical writing and scientific terms to people who do not have prior knowledge of the subject (e.g., high school science level). This summary should include the importance, impact, and content of your assignment to a broader audience.</i><br/> <i>[Team 23 is an example of an informative lay summary.]</i></p> <p>This topic was chosen because cervical cancer is largely preventable, yet it remains a major global health issue. Presenting the information through an interactive module allows complex scientific concepts to be communicated in a clear, engaging, and accessible way for students and the public. The goal of the project is to improve awareness of HPV-related cancer and emphasize the importance of prevention and early detection.</p> |
| <p><b>3. Provide up to 6 keywords relevant to your PULSE experiential assignment.</b><br/> <i>3-6 keywords are ideal.</i></p> <ul style="list-style-type: none"> <li>• HPV</li> <li>• Cervical cancer</li> <li>• Viral carcinogenesis</li> <li>• Tumor suppressor genes</li> <li>• Dysplasia</li> <li>• Prevention</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <p><b>4. Identify the course topic with which your PULSE assignment most aligns.</b><br/> <i>Refer to the various topics outlined under 'Course content and Schedule' in the syllabus (e.g. Inflammation).</i></p> <p><b>Female Genital Tract</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p><b>5. What are the learning outcomes?</b><br/> <i>There should be a minimum of 2 learning outcomes for your assignments. For further information on learning outcomes, the Centre for Teaching and Learning offers information:</i><br/> <a href="https://teaching.uwo.ca/curriculum/coursedesign/learning-outcomes.html">https://teaching.uwo.ca/curriculum/coursedesign/learning-outcomes.html</a></p> <ol style="list-style-type: none"> <li>1. Describe the role of human papillomavirus (HPV) in the development of cervical cancer</li> <li>2. Explain how viral proteins disrupt normal cell cycle regulation and lead to neoplastic transformation</li> <li>3. Identify the stages of cervical cancer progression from dysplasia to invasive carcinoma</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                           |
| <p><b>6. Why did the team select the chosen topic and the medium? How will the topic and medium of choice help learners?</b></p> <p>I selected this topic because HPV-associated cervical cancer is a clear and well-studied example of viral carcinogenesis, a key concept in pathology. It allows the</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

connection of molecular mechanisms, such as the inactivation of tumor suppressor proteins p53 and Rb, to broader concepts like uncontrolled cell proliferation and cancer progression. Additionally, this topic has strong public health relevance, as cervical cancer is largely preventable through vaccination and routine screening.

I chose an interactive Genially learning module as my medium because it promotes active learning and engagement (1). Unlike static formats, this platform allows users to explore content at their own pace through clickable elements, animations, and layered information. This is especially effective for explaining complex processes like viral infection and cancer progression, as learners can break down the information step-by-step. The interactive format also improves knowledge retention by encouraging participation rather than passive reading, making the content more accessible and memorable for a wide audience (1).

**7. Did the team use an artificial intelligence (AI) technology tool? If so, which AI technology tool(s) did the team use? What other technology tools did the team use? Is the technology tool novel? Is the team using this technology tool in a novel fashion? If the team did not use technology tool, why did the team decide against using the technology tool(s)?**

*Please include details (e.g., for what purpose was the tool used for? Why was the tool the best tool to use for your assignment? Are there alternative tools that were considered?)*

The primary platform used was Genially, which allowed me to create a dynamic learning experience using clickable elements, animations, and layered information. This enhanced user engagement and allowed learners to explore concepts at their own pace.

I used ChatGPT to assist with simplifying complex pathology concepts and to help organize my ideas into clear explanations suitable for an interactive learning module. The tool was particularly helpful in structuring content into logical, step-by-step sections that align with the interactive format.

I considered making a static infographic on HPV and cervical cancer. However, after looking into different options, a Canva infographic was not the best option in making an educational tool to help future students learn Pathology 3500 concepts. While these tools are not individually novel, I combined them to create an interactive, educational module that integrates scientific accuracy with engaging digital design.

**8. How is your PULSE experiential assignment innovative and/or novel?**

*Describe what about the PULSE assignment is innovative/novel. Is there a particular component or content that is innovative/novel? How is it different from other content that already exists?*

This PULSE assignment is innovative because it transforms complex pathology content into an interactive learning experience rather than a traditional static format. By using a Genially module, the project allows users to actively engage with the material through clickable elements, animations, and progressive disclosure of information.

A key novel aspect of this assignment is the stepwise visualization of cervical cancer development, where users can interact with each stage, from HPV infection to invasive cancer, at their own pace. This approach enhances understanding by breaking down complex processes into manageable sections.

Additionally, the module integrates both scientific mechanisms and public health messaging, allowing users not only to understand how cervical cancer develops but also how it can be prevented. This combination of interactivity, accessibility, and real-world relevance makes the project distinct from traditional educational materials.

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| <p><b>9. If you used an AI tool, please copy and paste the prompt(s)/question(s) used along with the output(s)/answer(s) from the AI tool.</b></p> <p><i>The response here is to allow others to replicate the team's work. If the prompts/outputs are lengthy (over 1 page), please attach it as a separate document and note below [Please see attached document].</i></p> <p><b>Prompt:</b></p> <p>"How can I simplify complex pathology concepts about HPV, including how it causes cervical cancer through E6 and E7 proteins, into an easy-to-understand interactive learning module for a general audience?"</p> <p><b>Output:</b></p> <p>To simplify complex pathology concepts into an engaging and understandable interactive module, focus on breaking the information into clear, logical steps and using simple language supported by visuals.</p> <p>Start with a brief introduction that defines key terms like HPV and cervical cancer in a way that does not assume prior knowledge. Then, organize your content into a progression: first explain what HPV is, then how it infects cervical cells, and finally how it leads to cancer.</p> <p>When explaining molecular mechanisms, avoid overly detailed biochemical pathways. Instead, focus on the key ideas. For example, explain that the HPV proteins E6 and E7 interfere with important protective proteins in the cell. You can say that E6 disables p53, which normally helps damaged cells die, and E7 disables Rb, which normally controls cell division. Emphasize the outcome: cells begin to grow uncontrollably. Use visuals and interactivity to reinforce learning. For example, include clickable diagrams showing HPV entering a cell, or step-by-step progression from normal cells to dysplasia to cancer. Present information in layers so users are not overwhelmed all at once.</p> <p>Your idea of a real case example in the module would be meaningful. Include a real-world connection such as a short case example and a section on prevention. Highlight that HPV vaccination and regular screening can significantly reduce the risk of cervical cancer.</p> <p>Finally, include a few short questions or interactive checkpoints and end with a concise summary of key takeaways. This structure helps reinforce learning and ensures the content is both accessible and memorable.</p> |
| <p><b>10. If you did not use an AI tool, please attach a copy of the team's notes to the assignment.</b></p> <p><i>The response here is to allow others to observe the 'behind the scenes' team's work.</i></p> <p>N/A</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <p><b>11. How did the team ensure the veracity of the information presented in the PULSE assignment?</b></p> <p><i>The response should highlight how the team has ensured that the information presented in the assignment is evidence-based and not spreading misinformation. You should specifically mention which databases (if any) or textbook materials you used, and how you kept track of the sources/references for each claim. If AI provided you with false information, please describe how the team has fact-checked the AI response and the legitimate (scientific) sources you used. A reference document should be provided in the reference section (15. References) below. Please ensure to include in-text citations in your assignment where applicable.</i></p> <p>The accuracy of the information presented in this assignment was ensured by consulting reputable, evidence-based online sources, including peer-reviewed articles</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

accessed through PubMed and publicly available health information from trusted institutions. These sources were used to verify key concepts related to HPV infection, viral carcinogenesis, and cervical cancer progression. Any content initially generated with the assistance of AI tools was carefully reviewed and fact-checked against these credible sources to avoid misinformation.

**12. Write a meaningful team reflection about the PULSE session (max 250 words).**

*Prompts to help your team write the reflection: Were there any team/individual biases that surfaced when creating content for the assignment? Did the team implement any practices to ensure the content was equitable, diverse, and/or inclusive? How has the PULSE assignment helped with the team's learning? If the team had to estimate, how long did the assignment take? What worked well for your team? What would the team do differently next time? What were the opportunities and challenges with creating the PULSE assignment to help others' learning? Were there any barriers or limitations?*

**Reflection:**

This assignment allowed me to deepen my understanding of how molecular pathology concepts can be translated into an engaging and interactive learning experience. One of my strengths throughout this project was maintaining organization while ensuring that all content remained accurate, clear, and consistent.

I was mindful of potential biases in how health information is presented, particularly around preventable diseases. To address this, I aimed to present cervical cancer in an informative and non-judgmental way, while emphasizing accessibility to screening and vaccination.

Designing an interactive module was both rewarding and challenging. While it allowed me to create a more engaging learning experience, it also required careful consideration of how to structure content so users could navigate it easily without becoming overwhelmed. Balancing scientific detail with clarity was a key challenge, as I needed to simplify complex concepts without losing accuracy.

Overall, this project improved both my understanding of pathology and my ability to communicate complex ideas effectively. If I were to approach this assignment again, I would spend more time refining the interactivity and user flow to further enhance the learning experience.

**13. Write the contributions of individual team members using unique initials.**

*Example: All team members contributed to the design of the prompts used in the technology tool, ChatGPT (GPT-3.5). T.K and T.K2 fact checked the information presented by ChatGPT using published literature on PubMed (PMID 29211319, 32477271). Y.Z finalized and formatted the final infographic and compiled the prompts and outputs. P.E was involved in...*

I (ET) am the only member of this group; therefore, I planned and executed the whole project.

## 15. References

Please provide a numbered reference list with Nature citation style. [Please feel free to use citation management software (i.e., free citation manager, e.g., Zotero and Mendeley)]

1. R. Maceiras, Feijoo J, V. Alfonsín, L. Perez-Rial. Effectiveness of Active Learning Techniques in Knowledge Retention among Engineering Students. Education for Chemical Engineers. 2025 Jan 1;51.
2. National Cancer Institute. HPV and Cancer [Internet]. National Cancer Institute. 2025. Available from: <https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-and-cancer>
3. NCI Dictionary of Cancer Terms [Internet]. Cancer.gov. 2026 [cited 2026 Apr 10]. Available from: <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/cervical-intraepithelial-neoplasia?redirect=true>
4. Basukala O, Banks L. The Not-So-Good, the Bad and the Ugly: HPV E5, E6 and E7 Oncoproteins in the Orchestration of Carcinogenesis. Viruses [Internet]. 2021 Sep 22;13(10):1892. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8541208/>
5. Lily's story - Cervical cancer caused by HPV - Minnesota Dept. of Health [Internet]. State.mn.us. 2019. Available from: <https://www.health.state.mn.us/people/immunize/basics/stories/lily.html>

## 16. Annotated Bibliography

*An annotated bibliography is a list of sources (books, articles, websites, etc.) that you used for your project. Each entry has two parts:*

- 1. Citation – written in the required citation style (same formatting and order as the Nature citation style in your list of references).*
- 2. Annotation – a short paragraph that summarizes, evaluates, and explains how the source is useful for your assignment.*

1. R. Maceiras, Feijoo J, V. Alfonsín, L. Perez-Rial. Effectiveness of Active Learning Techniques in Knowledge Retention among Engineering Students. Education for Chemical Engineers. 2025 Jan 1;51.

This article explains the importance of active learning techniques and how they impact learning. It was published in the Journal of Education for Chemical Engineers in 2025 and written by Rocío Maceiras and colleagues. Maceiras has an h-index of 23 and many published articles, highlighting the credibility of this article. One weakness of this study is that it was done on a sample of 95% males. Including more women in the study would yield more applicable results. This source will be used to explain the importance of the interactive elements of my assignment. The engaging elements hopefully will increase understanding and retention of the information I am presenting.

2. National Cancer Institute. HPV and Cancer [Internet]. National Cancer Institute. 2025. Available from: <https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-and-cancer>

This web page published by the National Cancer Institute explains what HPV is, how it's transmitted, it's relation to cervical cancer, and how it can be prevented. This web page aims to educate the public on the virus and the importance of getting vaccinated at a young age. One strength on this page is that it explains complex terms, like dysplasia, in a more approachable fashion. It has been updated as of 2025, making it a credible source for HPV information. I will use this source to help me explain HPV in my assignment. Understanding the relationship between HPV infection and cervical cancer is a key take-away from my assignment, making the information provided on this page an important resource to validate my assignment.

3. NCI Dictionary of Cancer Terms [Internet]. Cancer.gov. 2026 [cited 2026 Apr 10]. Available from: <https://www.cancer.gov/publications/dictionaries/cancer-terms/def/cervical-intraepithelial-neoplasia?redirect=true>

This web page, also published by the National Cancer Institute, defines cervical intraepithelial neoplasia. This term is a crucial part of my assignment where I explain the progression of HPV infection to cervical cancer. It will help me provide a clear explanation of what CIN is and why it is relevant to my assignment. This page is from a credible national institute, making me confident in the accuracy of its information.

4. Basukala O, Banks L. The Not-So-Good, the Bad and the Ugly: HPV E5, E6 and E7 Oncoproteins in the Orchestration of Carcinogenesis. Viruses [Internet]. 2021 Sep 22;13(10):1892. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8541208/>

This article, published in the credible journal of Viruses, explains how specific HPV oncoproteins are involved in carcinogenesis. It highlights the E6 and E7 proteins by explaining their functions on a molecular level. This highlights the profound pathological

impact that HPV has on host cells. I will use this source to support my explanation of how HPV infects and hijacks host DNA, a crucial part in causing cervical cancer. This source will strengthen my ability to accurately communicate the HPV infection process.

5. Lily's story - Cervical cancer caused by HPV - Minnesota Dept. of Health [Internet]. State.mn.us. 2019. Available from: <https://www.health.state.mn.us/people/immunize/basics/stories/lily.html>

This web page is about a woman named Lily, who was diagnosed with cervical cancer at the age of 27. Written by the Minnesota Department of Health and updated in 2026, this credible source highlights an actual case of an individual who experienced the disease process I am covering. This article will help me relate the dense scientific information I am presenting to a real example of the disease. Lily's story is emotional, and she highlights the importance of the HPV vaccine, one of the key take-aways of my assignment. This web page will hopefully help connect the scientific content to the impact it has on public health.