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# Deliberative Democracy: HeLa Cells

## Alignment with Course Content

This module can be used to reinforce understanding of cell cycle functions.

## Necessary Background Knowledge

- Cell cycle
- Cell structure and function
- Metabolic and signaling pathways
- Central dogma

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## Policy Question

Your group is being asked to make a policy recommendation regarding the ethics surrounding patient consent, using HeLa cells as an example. How would you prioritize scientific innovation versus patient consent? Does the value of the use of HeLa cells justify the lack of informed consent?

## Module Goals

- Understand how cell culture works and the value of it as a tool
- Describe how the cell cycle functions in normal versus cancerous cells
- Address a problem with consideration of multiple variables - both scientific and socioeconomic factors

## Deliberation Scaffolding

### Students should consider

- How are samples collected from patients?
- How is medical data collected and treated in the US today? Historically?
- What does informed consent mean, and how is it collected?
- What is cell culture? What is an immortal cell line?
- What kinds of ethics are at play when a patient's family must give consent?
- What happens to cancerous cells during the cell cycle?
- What kinds of mechanisms help cancerous cells proliferate?
- What kinds of signaling pathways are involved?
- Why is it important to understand the signaling pathways involved during the cell cycle?

## Instructor Notes

### Implementation Suggestions

- The module topic and peer-reviewed article can be tied to bioethics and cell cycle regulation.
- The peer-reviewed assignment in an open-ended format can be completed as an in-class activity rather than outside of class
- For wrapping up on the final discussion day, choose several groups that investigated different aspects of the problem (e.g. socioeconomic, ethical, etc.) to make a very short (2 minute) presentation of the key points that led to their science advisory statement

## Articles

### Media:

[Smithsonian 2010-Henriette Lacks' 'Immortal' Cells](#)

### Peer reviewed:

[Biotechnology Letters 2012-Taxol-induced alteration of intracellular amino-acid profile related to human cervical carcinoma HeLa cell death](#)

DOI: 10.1007/s10529-011-0730-5

## Informative Articles Students Might Find

[Peer Review-Aboriginal genome analysis comes to grips with ethics](#)

[Media-Gene patents in the dock](#)

[Peer Review-Sequencing studies in human genetics: design and interpretation](#)

[Media-Defense Lawyers Fight DNA Samples Gained on Sly](#)

[Media-The rise of the 'narciss-ome'](#)

[Media-Troubling History In Medical Research Still Fresh For Black Americans](#)

[Media-'Henrietta Lacks': A Donor's Immortal Legacy](#)

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## Media Article (Multiple-Choice Assignment Ideas)

[Smithsonian 2010-Henriette Lacks' 'Immortal' Cells](#)

*Henrietta Lacks' 'Immortal' Cells* by Sarah Zielinski

Example question topics:

- Why are HeLa cells so important to cell biology?
- What is one reason why the HeLa cell line is controversial?
- How was patient consent violated in the case of HeLa cells?

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## Peer Reviewed Article (Multiple-Choice Assignment Ideas)

[Biotechnology Letters 2012-Taxol-induced alteration of intracellular amino-acid profile related to human cervical carcinoma HeLa cell death](#)

DOI: 10.1007/s10529-011-0730-5

*Taxol-induced alteration of intracellular amino-acid profile related to human cervical carcinoma HeLa cell death* by Xiao-Fei Han, Yan-Qiu Liu, Long-Xing Wang, Qian-Xu Yang, & Hong-Bin Xiao

Example question topics:

- The purpose of different sections within a peer-reviewed article (e.g., introduction and experimental)
- Describing the general idea behind cell culture methods
- Describing how the results might be applied or built upon
- Describing the importance of data presented in tables and figures

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## Peer Reviewed Article (Alternate Open-Ended Assignment Ideas)

[Biotechnology Letters 2012-Taxol-induced alteration of intracellular amino-acid profile related to human cervical carcinoma HeLa cell death](#)

DOI: 10.1007/s10529-011-0730-5

*Taxol-induced alteration of intracellular amino-acid profile related to human cervical carcinoma HeLa cell death* by Xiao-Fei Han, Yan-Qiu Liu, Long-Xing Wang, Qian-Xu Yang, & Hong-Bin Xiao

1. What was the central motivating factor behind the work? That is, why did the authors start the work?
2. If the paper is hard to understand (at first), what would be your next step?
3. Why is having the control group important?
4. What is Taxol? What does it do?
5. What is the importance of Figure 1b? What does the star mean?
6. What are the major findings of this study, and why are they important?

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## Deliberative Democracy: HeLa Cells

Leader First & Last Name		Facilitator/Spokesperson First & Last Name	
Recorder First & Last Name		Devil's Advocate/Summarizer First & Last Name	

*Your group is being asked to make a policy recommendation regarding the ethics surrounding patient consent, using HeLa cells as an example. How would you prioritize scientific innovation versus patient consent? Does the value of the use of HeLa cells justify the lack of informed consent?*

What do you need to know before you can make an informed recommendation?	Why does this missing piece of information matter? (include social and science rationales)	Who will find 2-3 peer-reviewed articles about this concept?
A.		1.  2.  3.
B.		1.  2.  3.

-Day 1-

<b>C.</b>		1.  2.  3.
<b>D.</b>		1.  2.  3.

**Before doing background research, what is your group's initial stance on scientific innovation versus patient consent?**

End of Day 1. Consult your textbook and find at least 2 peer-reviewed articles per question for next week.

Leader First & Last Name AND Exam Number		Facilitator/Spokesperson First & Last Name AND Exam Number	
Recorder First & Last Name AND Exam Number		Devil's Advocate/Summarizer First & Last Name AND Exam Number	

***Your group is being asked to make a policy recommendation regarding the ethics surrounding patient consent, using HeLa cells as an example. How would you prioritize scientific innovation versus patient consent? Does the value of the use of HeLa cells justify the lack of informed consent? Please briefly explain the reasoning behind your consensus.***

Evidence to support your science advisory recommendation:	Source title and journal (with initials of who contributed this article):	Which lecture topics or textbook chapters cover this material?
A.		
B.		

-Day 2-

<b>C.</b>		
<b>D.</b>		

Science Advisory Statement (**group consensus**):

End of Day 2. Thank you for investing your time and energy on this activity!