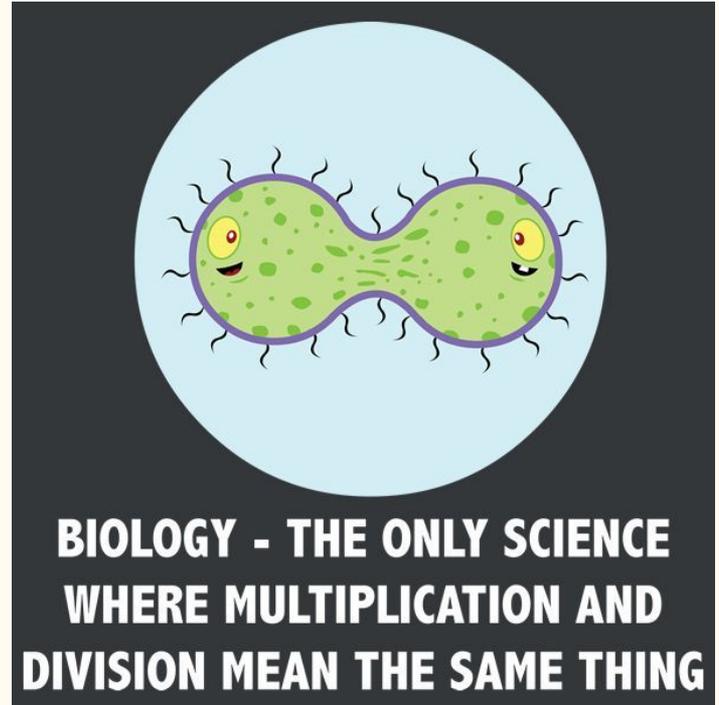


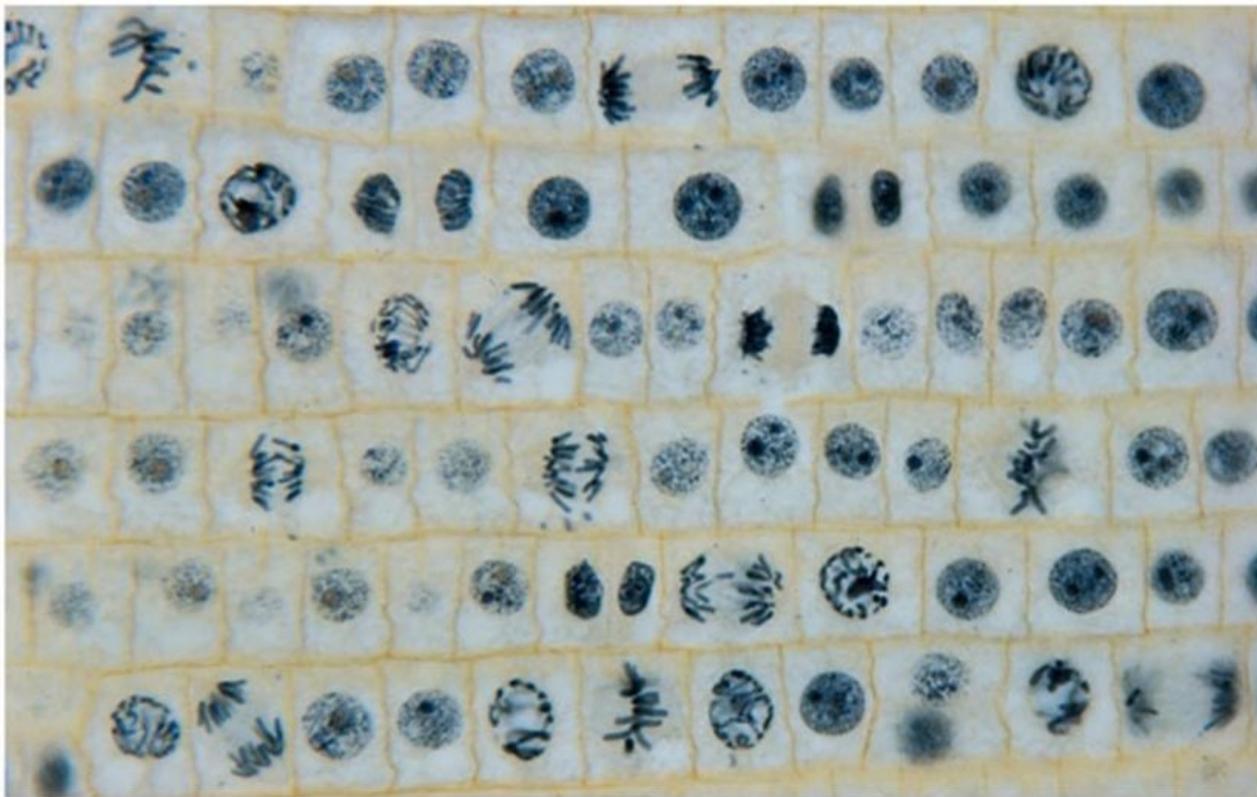
Agenda (Th/Fri)

- How is cell division different in eukaryotic and prokaryotic cells?
- Henrietta Lacks article annotated and questions together on Jamboard
<https://www.nature.com/articles/d41586-020-02494-z>
- Group for mitosis chart on Jamboard (meet on Zoom)



<https://www.pinterest.com/pin/280067670552813798/>

Onion Cells

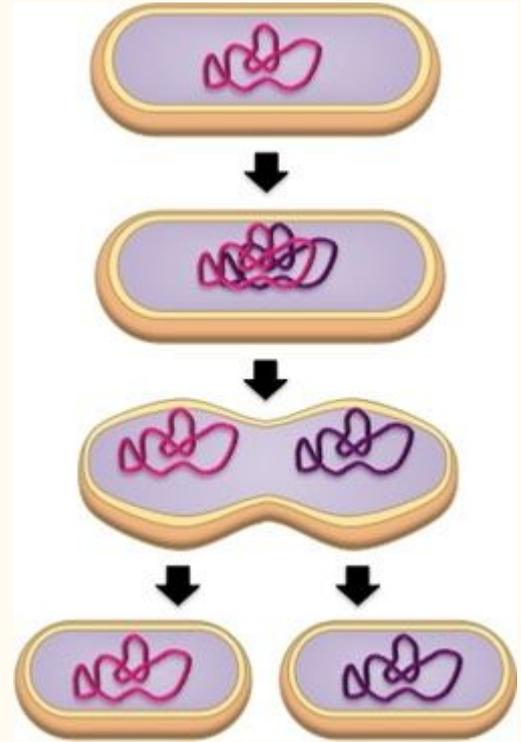


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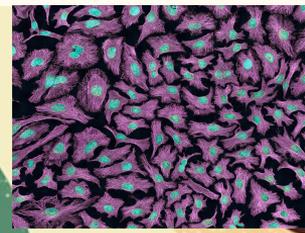
Prokaryotic Cell Division

Binary fission is how cells divide in prokaryotic cells:

- Circular DNA is copied in response to a replication signal
- The two DNA loops attach to the membrane
- The membrane elongates and pinches off (cytokinesis), forming two cells



Henrietta Lacks (1st hour)



<https://www.tebu-bio.com/blog/wp-content/uploads/2017/11/HeLa-Cells-Multiphoton-fluorescence-image.jpg>

Jamboard discussion:

Hello! Share your thoughts on Henrietta Lacks

I find it interesting that scientists used Henrietta Lacks' cancer cells without her knowledge but openly shared them with scientists from around the world. -Charlotte

They're in the Covid vaccine and Lacks was a black woman. -Iana Walker

I find it interesting that HeLa cells are used for so many things now including cancer, immunology, and infectious disease, and even the covid 19 vaccines but that Henrietta's family didn't get a dime and that she wasn't know until a while later

With the help of HeLa cells, many people have been able to have a child because of in vitro fertilization - Abby V

I also think that it is interesting how some of her family wasn't mad and was instead glad that her cells could help save lives. -Charlotte

I found it interesting how her family didn't know and after they found out they wanted scientists to acknowledge that HeLa cells came from an African American woman -Sindi

I think one of my biggest takeaways is that so much scientific development happened by LUCK and if it weren't for one person the world would suck still. Benji

In the medical world back then they didn't really use consent when it came to researching smaller minorities and due to that little say was put into the well-being of many people. She was closed off from her family and spent the rest of her days in research labs where she was poorly taken care of and was treated with no human decency

Although they did it without her consent I'm glad that the decision had a big positive outcome. -Mara S

I think that what HeLa cells are doing for the world is amazing and wonderful, but what bugs me is that the cells were taken without knowledge or consent from Henrietta Lacks or her family members. - Brendan Myers

I'm surprised none of the the biotechnology or other companies that profited from her cells gave any money to Henrietta's family.-Emma Jackson

It's funny that her family wasn't compensated or informed that Henrietta's cells were helping fight disease or that it was being used for medical science all over but they weren't mad -Braylon

I find it interesting how her cells were still surviving and reproducing because they were immortal. Khamari Sifika

I'm surprised that the science labs let Erik Johnson hold her great-grandmother's cells in her hand. - Andrew Wu

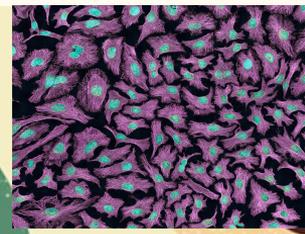
Her type of cells were involved in key discoveries in many fields, including cancer, immunology and infectious disease.- Dominik L

It is surprising that consent is still not always required in the United States today. - Quinn S.

Takeaway points:

- Henrietta Lacks is a Black woman who was diagnosed with a malignant tumor on her cervix in 1951
- Dr. Grey took a biopsy cell sample of the tumor cells and found that whereas other, normal cancer cells would quickly die, Lacks' cells would double every 20-24 hours
- Her cells have been very beneficial in studying the effects of toxins, studying the human genome, and developing vaccines
- Because this incident occurred in the 1950's, the ethical laws at that time were not very strict, and her cells were being used without her consent.

Henrietta Lacks (4th hour)



<https://www.tebu-bio.com/blog/wp-content/uploads/2017/11/HeLa-Cells-Multiphoton-fluorescence-image.jpg>

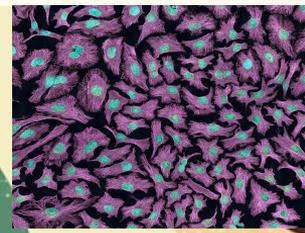
Jamboard discussion:

<p>Henrietta lacks article thoughts - Mrs. Abbas</p>	<p>No matter what ones race is, recognition should be given for something as wonderful as that. - Audrey Kaye</p>	<p>It is interesting how scientists used HeLa cells to test vaccines for COVID-19. - Rosa</p>	<p>Its cool that Henriettas cells were used to help for the research of vaccines against COVID-19 -Aurora Kunze-Fox</p>	<p>It really interesting that after she died one of her own family members got to work with her cells I will say they didn't ask for her consent so that kind of not fair but it is still cool-Anna</p>	<p>I find it cool how they are using HeLa to help research COVID-19 -Jolie Fellows</p>	<p>It's interesting to see how HeLa cells have helped many people, but the very person/descendants they were taken from haven't benefited much from them. -Madison</p>
<p>I think it's super cool that she would be a hundred years old right now, and her great grandchild got a chance to work with her cells. - Katalyn Thorson</p>	<p>It's cool that HeLa cells are still relevant in research and development-Karan Deol</p>	<p>I don't think its right that they used the HeLa cells without the family's consent - Nicholas Hankins</p>	<p>I think its unfair that Henrietta's cells were taken without her consent. -Dakota Morin</p>	<p>It's weird to think that the cells of someone long dead are curing a disease that they never knew about -Brady</p>	<p>How was Henrietta Lack cells were immortal? - Keith Griffin</p>	<p>Also, what makes HeLa cells behave the way they do? -Madison</p>
<p>I think its cool how Henrietta Lacks cells are being used for research for the covid 19 vaccine-Logan Marshall</p>	<p>Anaphase is where the chromosomes move farther away from one another and go to opposite poles. - Audrey Kaye.</p>	<p>I feel like it wasn't nice to take her cells without her knowing - Dennis</p>	<p>I think it's really cool that scientists can use her cells to help with our current virus we have, corona virus.-Katalyn Thorson</p>	<p>The hospital where her cells were collected was one of only a few that provided medical care to Black people.- Megan lux</p>	<p>I think it was very wrong that they didn't ask for her consent before examining her cells and sharing her info, I wonder if she was a different race they would have asked for consent.-Fabiola D.</p>	
<p>It's cool how they presumed her cells to be "immortal" - Elijah Meyer</p>	<p>The hospital where her cells were at, was one of the very few that provided medical care to black people, this article is not only about biology but its also about how we all, whites and colors, should be allowed to have medical care. - scarlet lee</p>	<p>I think it is very interesting that her cells are still used today but I do think that they should have gotten consent to use them. -Marla Zarbeck</p>	<p>I think it must have been a shock for Erika Johnson to go to class and find the remains of her great-grandmother through the HeLa cells. - Lizbeth Jaimes</p>	<p>I dislike the fact that researchers took some of her cells without consent, but at least her cells are going to good use. (Amarah W.)</p>	<p>It's great that we can talk about Henrietta Lacks incredible contributions, although it is unbelievable and should be a future example that she wasn't given recognition in her time - Julian Wilson</p>	

Takeaway points:

- Henrietta Lacks is a Black woman who was diagnosed with a malignant tumor on her cervix in 1951
- Dr. Grey took a biopsy cell sample of the tumor cells and found that whereas other, normal cancer cells would quickly die, Lacks' cells would double every 20-24 hours
- Her cells have been very beneficial in studying the effects of toxins, studying the human genome, and developing vaccines
- Because this incident occurred in the 1950's, the ethical laws at that time were not very strict, and her cells were being used without her consent.

Henrietta Lacks (3rd hour)



<https://www.tebu-bio.com/blog/wp-content/uploads/2017/11/HeLa-Cells-Multiphoton-fluorescence-image.jpg>

Jamboard discussion:

I think it's unfair that HeLa cells were taken without consent, but her family thought the cells should continue to be used - Micaiah Ernsberger

I think it is very interesting that HeLa cells were being used for research in the making of the Covid-19 Vaccine. - Micaiah Ernsberger

I think it is shocking that doctors gave Henrietta's medical records to the media, which I think should be private and only given with her or her family's consent -e.b.

she loved spaghetti and thats very cool -jt

When did not getting consent for using someones cells for science become illegal, like what year and what would happen if someone did? - Nola

I thought it was interesting that Henrietta's family thought that her cells should continue to be used because they were doing good things even though they were taken wrongly -e.b.

I wonder what the reaction of Henrietta's family was when they saw that all of her records were in the media, and saw news about her. - Micaiah Ernsberger

I don't think they should have made her medical records public -charlie

I wonder why she wore RED nail polish, and not something else. - Micaiah Ernsberger

Takeaway points:

- Henrietta Lacks is a Black woman who was diagnosed with a malignant tumor on her cervix in 1951
- Dr. Grey took a biopsy cell sample of the tumor cells and found that whereas other, normal cancer cells would quickly die, Lacks' cells would double every 20-24 hours
- Her cells have been very beneficial in studying the effects of toxins, studying the human genome, and developing vaccines
- Because this incident occurred in the 1950's, the ethical laws at that time were not very strict, and her cells were being used without her consent.

Cell Cycle Group Activity (1st hour)

Each group member is assigned a stage from the cell cycle. Draw out your stage on Jamboard and we will view all the charts together at the end as a class. Each group has 6 students.

Group 1

Excellent job you guys! Looks wonderful - Mrs. Abbas

Interphase (Abyy) The first stage of mitosis where the cell gets itself ready for the rest of the cycle by duplicating its organelles, DNA and even growing in size.

Prometaphase Chromatin are packed tightly into chromosomes and are preparing to divide. The last stop of prophase also takes away the Nucleus so they can divide. -Andrew

Metaphase (Brendan) The stage when all of the chromosomes line up in a straight line.

Anaphase Anaphase-replicated chromosomes are split onto separate sides of the cell

Telophase (Brendan) The stage where the spindle fibers disappear, the nuclear membrane forms around the chromosomes, the chromosomes decondense, and the cell wall forms between the two new nuclei

Cytokinesis (Charlotte) - the stage in mitosis in which the cytoplasm is split and the two daughter cells are completely duplicated.

Group 2

Step 1: Interphase: The cell duplicates its organelles, replicates its DNA, grows in size, and produces the nutrients and ATP it needs in order to divide. Interphase happens in 3 times cell growth, DNA replication, cell growth.

Step 2: Prophase: The nuclear membrane disappears and chromosomes come together. -Dominik

Step 3: Metaphase: The 2 Chromosomes line up in the middle of the nucleus and are split into 4 different sister-chromatids - Elijah Jones

Step 4: Anaphase: The chromatids of each chromosome have separated and are moving toward the poles. -Emma Jackson

Step 5: Telophase is the fifth and final phase of mitosis, the process that separates the duplicated genetic material carried in the nucleus into two identical daughter cells.

Step 6: Cytokinesis is the physical process of cell division, which divides the cytoplasm into two daughter cells. -Iana Walker

I see something wonderful coming together Keep it up guys! - Mrs. Abbas

Group 3

Excellent job guys! Looks wonderful! Mrs. Abbas

Interphase Interphase is the step in which the cell grows bigger while duplicating its organelles, replicates its DNA and prepares for the start of making the ATP and other building blocks.

Prophase 2: Prophase is the first stage in cell division during prophase when the spindle fibers condense from centrosomes/centrioles

Metaphase 4: Metaphase - When all of the chromosomes line up in a straight line

Anaphase 5: During the anaphase, the chromosomes go to opposite cell poles and are pulled into two nuclei and the nuclear membrane begins to disappear.

Telophase During the telophase the spindle fibers disappear, the nuclear membrane forms around the chromosomes, the chromosomes decondense, and the cell wall forms between the two new nuclei

Cytokinesis Cytokinesis is a step in the cell process when the two daughter cells divide completely and a nuclear membrane forms around each chromosome.

Group 4

Excellent job guys! Looks wonderful! Mrs. Abbas

Interphase: DNA condenses into chromatids, centrosomes/centrioles are visible on both sides of the cell, nuclear membrane has NOT begun to dissolve.

Prophase: DNA becomes chromosomes, Spindle fluids appear from centrosomes. Nuclear membrane breaks down

Metaphase: the process that separates duplicated genetic material carried in the nucleus of a parent cell into two identical daughter cells.

Anaphase: cohesin proteins binding the sister chromatids together break down. sister chromatids (now called chromosomes) are pulled toward opposite poles.

Telophase: Each newly forming cell gets a nucleus. Chromosomes uncoil to form chromatin. 2 diploid body cells are being formed.

Quinn

- + M F M
- Group 1:**
 Abby Interphase
 Andrew Prophase
 Benjamin Metaphase
 Braylon Anaphase
 Brendan Telophase
 Charlotte Cytokinesis
- Group 2:**
 Dalik Interphase
 Dominik Prophase
 Elijah Metaphase
 Emma Anaphase
 Harper Telophase
 Iana Cytokinesis
- Group 3**
 Imar Interphase
 Jalen Prophase
 Jayden Metaphase
 Kelly Anaphase
 Khamarie Telophase
 Nigel Cytokinesis
- Group 4:**
 Quinn Interphase
 Roben Prophase
 Nikolas Metaphase
 Sindi Anaphase
 Viridian Telophase/Cytokinesis

Cell Cycle Jigsaw Group Activity (3rd hour)

Each group member is assigned a stage from the cell cycle. Draw out your stage on Jamboard and we will view all the charts together at the end as a class. Each group has 6 students.

Homework

- 7A. Henrietta Lacks annotated article (in class)
- 7B. Picture of cell cycle chart on GC (in class)
- 7C. Mitosis Drag and Drop EXTRA CREDIT

Step 1: Drag the boxes to indicate the phase of the cell cycle

Anaphase	Interphase
Prophase	Cytokinesis
Telophase	Metaphase

Step 2: Label individual parts of the cell by dragging the letters to the structures

A	A. Spindle
B	B. Centrioles
C	C. Daughter Cells
D	D. Chromosomes
E	E. Sister Chromatids
F	F. Chromatin

