

The Immortal Cells of Henrietta Lacks

Fonte: <https://youtu.be/22IGbAVWhro>



English Transcript	Tradução
Imagine something small enough to float on a particle of dust that holds the keys to understanding cancer, virology, and genetics.	Imagine algo pequeno o suficiente para flutuar em uma partícula de poeira que contenha as chaves para entender o câncer, a virologia e a genética.
Luckily for us, such a thing exists in the form of trillions upon trillions of human lab-grown cells called HeLa.	Felizmente para nós, tal coisa existe na forma de trilhões e trilhões de células humanas cultivadas em laboratório chamadas HeLa.
Let's take a step back for a second.	Vamos dar um passo atrás por um momento.
Scientists grow human cells in the lab to study how they function, understand how diseases develop, and test new treatments without endangering patients.	Cientistas cultivam células humanas no laboratório para estudar como elas funcionam, entender como as doenças se desenvolvem e testar novos tratamentos sem colocar em risco os pacientes.
To make sure that they can repeat these experiments over and over, and compare the results with other scientists, they need huge populations of identical cells that can duplicate themselves faithfully for years, but until 1951, all human cell lines that researchers tried to grow had died after a few days.	Para garantir que possam repetir esses experimentos várias vezes e comparar os resultados com outros cientistas, eles precisam de grandes populações de células idênticas que possam se duplicar fielmente por anos, no entanto, até 1951, todas as linhagens de células humanas que os pesquisadores tentaram cultivar morreram após alguns dias.
Then a John Hopkins scientist named George Gey received a sample of a strange looking tumor: dark purple, shiny, jelly-like.	Então, um cientista de John Hopkins chamado George Gey recebeu uma amostra de um tumor de aparência estranha: roxo escuro, brilhante,



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	semelhante a gelatina.
This sample was special.	Essa amostra era especial.
Some of its cells just kept dividing, and dividing, and dividing.	Algumas de suas células continuavam se dividindo, e dividindo, e dividindo.
When individual cells died, generations of copies took their place and thrived.	Quando células individuais morriam, gerações de cópias tomavam seu lugar e prosperavam.
The result was an endless source of identical cells that's still around today.	O resultado foi uma fonte inesgotável de células idênticas que ainda existe hoje.
The very first immortal human cell line.	A primeira linhagem de células humanas imortais.
Gey labeled it "HeLa" after the patient with the unusual tumor, Henrietta Lacks.	Gey a rotulou como "HeLa" em homenagem à paciente com o tumor incomum, Henrietta Lacks.
Born on a tobacco farm in Virginia, she lived in Baltimore with her husband and five children.	Nascida em uma fazenda de tabaco na Virgínia, ela vivia em Baltimore com seu marido e cinco filhos.
She died of aggressive cervical cancer a few months after her tumorous cells were harvested, and she never knew about them.	Ela morreu de câncer cervical agressivo alguns meses após suas células tumorais serem colhidas, e nunca soube sobre elas.
So what's so special about the cells from Henrietta Lacks that lets them survive when other cell lines die?	Então, o que há de tão especial nas células de Henrietta Lacks que as permite sobreviver quando outras linhagens celulares morrem?
The short answer is we don't entirely know.	A resposta curta é que não sabemos completamente.
Normal human cells have built-in control mechanisms.	Células humanas normais têm mecanismos de controle embutidos.
They can divide about 50 times before they self destruct in a process called apoptosis.	Elas podem se dividir cerca de 50 vezes antes de se autodestruírem em um processo chamado apoptose.
This prevents the propagation of genetic errors that creep in after repeated rounds of division.	Isso evita a propagação de erros genéticos que surgem após rodadas repetidas de divisão.
But cancer cells ignore these signals, dividing indefinitely and crowding out normal cells.	Mas as células cancerígenas ignoram esses sinais, dividindo-se indefinidamente e suplantando células normais.
Still, most cell lines eventually die off, especially outside the human body.	Ainda assim, a maioria das linhagens celulares eventualmente morre, especialmente fora do corpo humano.
Not HeLa, though, and that's the part we can't yet explain.	Não as HeLa, porém, e essa é a parte que ainda não conseguimos explicar.
Regardless, when Dr. Gey realized he had the first immortal line of human cells, he sent samples to labs all over the world.	Independentemente disso, quando o Dr. Gey percebeu que tinha a primeira linhagem imortal de células humanas, ele enviou amostras para laboratórios em todo o mundo.
Soon the world's first cell production facility was churning out 6 trillion HeLa cells a week, and scientists put them to work in an ethically problematic way, building careers and fortunes off of Henrietta's cells without her or her family's consent, or even knowledge until decades later.	Logo, a primeira instalação de produção de células do mundo estava produzindo 6 trilhões de células HeLa por semana, e os cientistas as colocaram para trabalhar de uma maneira eticamente problemática, construindo carreiras e fortunas a partir das células de Henrietta sem o consentimento dela ou de sua família, ou mesmo conhecimento até décadas



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	depois.
The polio epidemic was at its peak in the early 50s.	A epidemia de pólio estava no auge no início dos anos 50.
HeLa cells, which easily took up and replicated the virus, allowed Jonas Salk to test his vaccine.	As células HeLa, que facilmente absorviam e replicavam o vírus, permitiram que Jonas Salk testasse sua vacina.
They've been used to study diseases, including measles, mumps, HIV, and ebola.	Elas foram usadas para estudar doenças, incluindo sarampo, caxumba, HIV e ebola.
We know that human cells have 46 chromosomes because a scientist working with HeLa discovered a chemical that makes chromosomes visible.	Sabemos que as células humanas têm 46 cromossomos porque um cientista trabalhando com HeLa descobriu um produto químico que torna os cromossomos visíveis.
HeLa cells themselves actually have around 80 highly mutated chromosomes.	As próprias células HeLa têm, na verdade, cerca de 80 cromossomos altamente mutados.
HeLa cells were the first to be cloned.	As células HeLa foram as primeiras a serem clonadas.
They've traveled to outer space.	Elas viajaram para o espaço sideral.
Telomerase, an enzyme that helps cancer cells evade destruction by repairing their DNA, was discovered first in HeLa cells.	A telomerase, uma enzima que ajuda as células cancerígenas a evitarem a destruição reparando seu DNA, foi descoberta primeiro nas células HeLa.
In an interesting turn of fate, thanks to HeLa, we know that cervical cancer can be caused by a virus called HPV and now there's a vaccine.	Em uma reviravolta interessante do destino, graças às HeLa, sabemos que o câncer cervical pode ser causado por um vírus chamado HPV e agora existe uma vacina.
HeLa-fueled discoveries have filled thousands of scientific papers, and that number is probably even higher than anyone knows.	Descobertas alimentadas por HeLa preencheram milhares de artigos científicos, e esse número é provavelmente ainda maior do que se sabe.
HeLa cells are so resilient that they can travel on almost any surface: a lab worker's hand, a piece of dust, invading cultures of other cells and taking over like weeds, countless cures, patents and discoveries all made thanks to Henrieta Lacks.	As células HeLa são tão resilientes que podem viajar em quase qualquer superfície: a mão de um trabalhador de laboratório, uma partícula de poeira, invadindo culturas de outras células e tomando conta como ervas daninhas, inúmeras curas, patentes e descobertas todas feitas graças a Henrietta Lacks.



Contagem de palavras

A tabela abaixo exibe as palavras encontradas neste vídeo, bem como o número de vezes em que aparecem.

Veja também: [Para que serve esta tabela?](#)

Freq.	Palavra	Freq.	Palavra	Freq.	Palavra
22	cells	20	the	19	and
18	a	17	of	14	that
13	to	12	hela	11	in
8	they	8	human	6	is
6	have	5	was	5	s
5	first	5	cell	5	cancer
5	can	4	with	4	we
4	over	4	her	4	dividing
4	an	4	after	3	when
3	them	3	so	3	she
3	scientists	3	other	3	on
3	lines	3	lacks	3	lab
3	know	3	henrietta	3	gey
3	for	3	died	3	chromosomes
3	called	3	all	3	about
2	world	2	without	2	were
2	virus	2	vaccine	2	us
2	until	2	tumor	2	trillions
2	took	2	this	2	these
2	themselves	2	their	2	thanks
2	test	2	study	2	still
2	special	2	scientist	2	sample
2	out	2	or	2	off
2	not	2	normal	2	line
2	like	2	its	2	immortal
2	identical	2	how	2	he
2	had	2	grow	2	few
2	even	2	dust	2	diseases
2	discoveries	2	discovered	2	die
2	cervical	2	by	2	but
2	be	2	around	1	yet
1	years	1	working	1	worker
1	work	1	which	1	what
1	week	1	weeds	1	way
1	visible	1	virology	1	virginia
1	very	1	used	1	upon



Freq.	Palavra	Freq.	Palavra	Freq.	Palavra
1	up	1	unusual	1	understanding
1	understand	1	turn	1	tumorous
1	trillion	1	tried	1	treatments
1	traveled	1	travel	1	today
1	tobacco	1	times	1	thrived
1	thousands	1	though	1	thing
1	there	1	then	1	than
1	telomerase	1	taking	1	take
1	survive	1	surface	1	sure
1	such	1	strange	1	step
1	space	1	source	1	soon
1	something	1	some	1	small
1	signals	1	short	1	shiny
1	sent	1	self	1	second
1	scientific	1	samples	1	salk
1	rounds	1	results	1	result
1	resilient	1	researchers	1	replicated
1	repeated	1	repeat	1	repairing
1	regardless	1	received	1	realized
1	put	1	purple	1	propagation
1	production	1	process	1	problematic
1	probably	1	prevents	1	populations
1	polio	1	place	1	piece
1	peak	1	patients	1	patient
1	patents	1	particle	1	part
1	papers	1	outside	1	outer
1	number	1	now	1	new
1	never	1	need	1	named
1	mutated	1	mumps	1	most
1	months	1	mechanisms	1	measles
1	makes	1	make	1	made
1	luckily	1	looking	1	lived
1	lets	1	let	1	later
1	labs	1	labeled	1	knows
1	knowledge	1	knew	1	keys
1	kept	1	just	1	jonas
1	john	1	jelly	1	it
1	invading	1	interesting	1	individual
1	indefinitely	1	including	1	imagine
1	ignore	1	husband	1	huge
1	hvp	1	hopkins	1	holds



Freq.	Palavra	Freq.	Palavra	Freq.	Palavra
1	hiv	1	his	1	highly
1	higher	1	henrieta	1	helps
1	harvested	1	hand	1	grown
1	george	1	genetics	1	genetic
1	generations	1	function	1	fueled
1	from	1	fortunes	1	form
1	float	1	five	1	filled
1	fate	1	farm	1	family
1	faithfully	1	facility	1	explain
1	experiments	1	exists	1	eventually
1	evade	1	ethically	1	especially
1	errors	1	epidemic	1	enzyme
1	entirely	1	enough	1	endless
1	endangering	1	ebola	1	easily
1	early	1	duplicate	1	dr
1	do	1	dna	1	division
1	divide	1	develop	1	destruction
1	destruct	1	decades	1	days
1	dark	1	cures	1	cultures
1	crowding	1	creep	1	countless
1	copies	1	control	1	consent
1	compare	1	cloned	1	churning
1	children	1	chemical	1	caused
1	careers	1	cannot	1	built
1	building	1	born	1	body
1	before	1	been	1	because
1	baltimore	1	back	1	at
1	are	1	apoptosis	1	anyone
1	any	1	answer	1	almost
1	allowed	1	aggressive	1	actually