[Template:Other uses](/wiki/Template:Other_uses" \o "Template:Other uses)

[thumb| Scanning electron micrograph of an](/wiki/File:HeLa-IV.jpg) [apoptotic](/wiki/Apoptosis) HeLa cell. Zeiss Merlin HR-SEM. [thumb|Multiphoton fluorescence image of cultured HeLa cells with a fluorescent protein targeted to the Golgi apparatus (orange), microtubules (green) and counterstained for DNA (cyan). Nikon RTS2000MP custom laser scanning microscope.](/wiki/File:HeLa-I.jpg) [thumb|](/wiki/File:HeLa_cells_stained_with_antibody_to_actin_(green)_,_vimentin_(red)_and_DNA_(blue).jpg)[Immunofluorescence](/wiki/Immunofluorescence) image of HeLa cells grown in tissue culture and stained with antibody to [actin](/wiki/Actin) in green, [vimentin](/wiki/Vimentin) in red and DNA in blue. Image courtesy of [EnCor Biotechnology Inc.](/wiki/EnCor_Biotechnology_Inc.)

A **HeLa cell** [Template:IPAc-en](/wiki/Template:IPAc-en), also **Hela** or **hela cell**, is a [cell](/wiki/Cell_(biology)) type in an [immortal cell line](/wiki/Immortalised_cell_line) used in scientific research. It is the oldest and most commonly used human cell line.[[1]](#cite_note-1) The line was derived from [cervical cancer](/wiki/Cervical_cancer) cells taken on February 8, 1951[[2]](#cite_note-2) from [Henrietta Lacks](/wiki/Henrietta_Lacks), a patient who died of her cancer on October 4, 1951. The cell line was found to be remarkably durable and prolific which warrants its extensive use in scientific research.[[3]](#cite_note-3)[[4]](#cite_note-4) The cells from Lacks' tumor were taken without her knowledge or consent by researcher [George Gey](/wiki/George_Gey), who found that they could be kept alive.[[5]](#cite_note-5) Before this, cells cultured from other cells would only survive for a few days. Scientists spent more time trying to keep the cells alive than performing actual research on them, but some cells from Lacks' tumor sample behaved differently from others. George Gey was able to isolate one specific cell, multiply it, and start a cell line. Gey named the sample HeLa, after the initial letters of Henrietta Lacks' name. They were the first human cells grown in a lab that were "immortal," meaning that they do not die after a few cell divisions, and they could be used for conducting many experiments. This represented an enormous boon to medical and biological research.[[4]](#cite_note-4) The stable growth of HeLa enabled a researcher at the University of Minnesota hospital to successfully grow [polio](/wiki/Polio) virus, enabling the development of a vaccine,[[6]](#cite_note-6) and by 1954, [Jonas Salk](/wiki/Jonas_Salk) developed a [vaccine for polio](/wiki/Polio_vaccine) using these cells.[[4]](#cite_note-4)[[7]](#cite_note-7) To test Salk's new vaccine, the cells were put into mass production in the first-ever cell production factory.[[8]](#cite_note-8) In 1955, HeLa cells were the first human cells successfully cloned.[[9]](#cite_note-9) Demand for the HeLa cells quickly grew. Since they were put into mass production, Lacks' cells have been used by scientists around the globe for "research into [cancer](/wiki/Cancer), [AIDS](/wiki/AIDS), the effects of radiation and toxic substances, [gene mapping](/wiki/Gene_mapping), and countless other scientific pursuits".[[7]](#cite_note-7) HeLa cells have been used to test human sensitivity to tape, glue, cosmetics, and many other products.[[4]](#cite_note-4) Scientists have grown some 20 tons of her cells,[[4]](#cite_note-4)[[10]](#cite_note-10) and there are almost 11,000 patents involving HeLa cells.[[4]](#cite_note-4)

## Contents

* 1 History[[edit](/index.php?title=(none)&action=edit&section=1)]
  + 1.1 Origin[[edit](/index.php?title=(none)&action=edit&section=2)]
  + 1.2 Use in research[[edit](/index.php?title=(none)&action=edit&section=3)]
* 2 Analysis[[edit](/index.php?title=(none)&action=edit&section=4)]
  + 2.1 Telomerase[[edit](/index.php?title=(none)&action=edit&section=5)]
  + 2.2 Chromosome number[[edit](/index.php?title=(none)&action=edit&section=6)]
  + 2.3 Complete genome sequence[[edit](/index.php?title=(none)&action=edit&section=7)]
* 3 Contamination[[edit](/index.php?title=(none)&action=edit&section=8)]
* 4 New species proposal[[edit](/index.php?title=(none)&action=edit&section=9)]
* 5 Additional images[[edit](/index.php?title=(none)&action=edit&section=10)]
* 6 See also[[edit](/index.php?title=(none)&action=edit&section=11)]
* 7 References[[edit](/index.php?title=(none)&action=edit&section=12)]
* 8 Further reading[[edit](/index.php?title=(none)&action=edit&section=13)]
* 9 External links[[edit](/index.php?title=(none)&action=edit&section=14)]

## History[[edit](/index.php?title=(none)&action=edit&section=1)]

### Origin[[edit](/index.php?title=(none)&action=edit&section=2)]

The cells were propagated by [George Otto Gey](/wiki/George_Otto_Gey) shortly before Lacks died of her cancer in 1951. This was the first human cell line to prove successful [in vitro](/wiki/In_vitro), which was a scientific achievement with profound future benefit to medical research. Gey freely donated these cells along with the tools and processes that his lab developed to any scientist requesting them simply for the benefit of science. Neither Lacks nor her family gave permission to harvest the cells but, at that time, permission was neither required nor customarily sought.[[11]](#cite_note-11) The cells were later commercialized, although never patented in their original form. There was no requirement at that time (or at the present) to inform patients or their relatives about such matters because discarded material or material obtained during surgery, diagnosis, or therapy was the property of the physician or the medical institution (this currently requires ethical approval and patient consent in the UK). This issue and Lacks' situation were brought up in the [Supreme Court of California](/wiki/Supreme_Court_of_California) case of [*Moore v. Regents of the University of California*](/wiki/Moore_v._Regents_of_the_University_of_California). The court ruled that a person's discarded tissue and cells are not his or her property and can be commercialized.[[12]](#cite_note-12) At first, the cell line was said to be named after a "Helen Lane" or "Helen Larson", to conceal the fact that Lacks' cells were taken without her knowledge or consent by Gey. Despite this attempt, her real name was used by the press within a few years of her death. These cells are treated as cancer cells, as they are descended from a biopsy taken from a visible lesion on the cervix as part of Lacks' diagnosis of cancer. A debate still continues on the classification of the cells.[Template:Citation needed](/wiki/Template:Citation_needed)

HeLa cells, like other cell lines, are termed ["immortal"](/wiki/Cell_culture#Concepts_in_mammalian_cell_culture) in that they can divide an unlimited number of times in a laboratory cell culture plate as long as fundamental cell survival conditions are met (*i.e.,* being maintained and sustained in a suitable environment). There are many [strains](/wiki/Strain_(biology)) of HeLa cells as they continue to mutate in [cell cultures](/wiki/Cell_culture), but all HeLa cells are descended from the same tumor cells removed from Lacks. The total number of HeLa cells that have been propagated in cell culture far exceeds the total number of cells that were in Henrietta Lacks' body.[[13]](#cite_note-13)

### Use in research[[edit](/index.php?title=(none)&action=edit&section=3)]

HeLa cells were used by [Jonas Salk](/wiki/Jonas_Salk) to test the first [polio vaccine](/wiki/Polio_vaccine) in the 1950s. They were observed to be easily infected by [poliomyelitis](/wiki/Poliomyelitis), causing infected cells to die.[[14]](#cite_note-14) This made HeLa cells highly desirable for polio vaccine testing since results could be easily obtained. A large volume of HeLa cells were needed for the testing of Salk’s polio vaccine, prompting the [National Foundation for Infantile Paralysis](/wiki/National_Foundation_for_Infantile_Paralysis) (NFIP) to find a facility capable of mass-producing HeLa cells.[[15]](#cite_note-15) In the spring of 1953, a cell culture factory was established at [Tuskegee University](/wiki/Tuskegee_University) to supply Salk and other labs with HeLa cells.[[16]](#cite_note-16) Less than a year later, Salk’s vaccine was ready for human trials.[[17]](#cite_note-17) HeLa cells were also the first human cells to be successfully cloned in 1955 by [Theodore Puck](/wiki/Theodore_Puck) and [Philip I Marcus](/wiki/Philip_I_Marcus) at the University of Colorado, Denver.[[18]](#cite_note-18) Since that time, HeLa cells have been used for "research into cancer, AIDS, the effects of radiation and toxic substances, gene mapping, and many other scientific pursuits".[[7]](#cite_note-7) According to author [Rebecca Skloot](/wiki/Rebecca_Skloot), by 2009, "more than 60,000 scientific articles had been published about research done on HeLa, and that number was increasing steadily at a rate of more than 300 papers each month."[[12]](#cite_note-12) HeLa cells have been used in testing how [parvo virus](/wiki/Parvovirus) infects cells of humans, HeLa, dogs, and cats.<ref name=Parker>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> These cells have also been used to study viruses such as the [Oropouche virus](/wiki/Oropouche_virus) (OROV). OROV causes the disruption of cells in culture, where cells begin to degenerate shortly after they are infected, causing [viral induction of apoptosis](/wiki/Viral_induction_of_apoptosis).[[19]](#cite_note-19) HeLa cells have been used to study the expression of the [papillomavirus](/wiki/Human_papillomavirus) E2 and apoptosis.[[20]](#cite_note-20) HeLa cells have also been used to study [canine distemper](/wiki/Canine_distemper) virus' ability to induce [apoptosis](/wiki/Apoptosis) in cancer cell lines,<ref name=DelPuerto/> which could play an important role in developing treatments for tumor cells resistant to radiation and chemotherapy.<ref name=DelPuerto>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> HeLa cells have also been used in a number of cancer studies, including those involving sex steroid hormones such as [Estradiol](/wiki/Estradiol), [estrogen](/wiki/Estrogen), and [estrogen receptors](/wiki/Estrogen_receptor), along with estrogen-like compounds such as [Quercetin](/wiki/Quercetin) and its cancer reducing properties.[[21]](#cite_note-21) There have also been studies on HeLa cells, the effects of flavonoids and antioxidants with [estradiol](/wiki/Estradiol) on cancer cell proliferation. HeLa cells were used to investigate the [phytochemical](/wiki/Phytochemical) compounds and the fundamental mechanism of the [anticancer activity of the ethanolic extract of mango peel](/wiki/Anticancer_activity_of_the_ethanolic_extract_of_mango_peel) (EEMP). EEMP was found to contain various phenolic compounds and to activate death of human cervical malignant HeLa cells through [apoptosis](/wiki/Apoptosis), which suggests that EEMP may help to prevent cervical cancer as well as other types of cancers.[[22]](#cite_note-22) In 2011, HeLa cells were used in tests of novel [heptamethine dyes](/wiki/Heptamethine_dyes) IR-808 and other analogs which are currently being explored for their unique uses in medical diagnostics, the development of [theranostics](/wiki/Theranostics), the individualized treatment of cancer patients with the aid of [PDT](/wiki/Photodynamic_therapy), co-administration with other drugs, and [irradiation](/wiki/Irradiation).<ref name=Tan>[Template:Cite journal](/wiki/Template:Cite_journal)</ref><ref name=Fpene>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> HeLa cells have been used in research involving [fullerenes](/wiki/Fullerenes) to induce [apoptosis](/wiki/Apoptosis) as a part of [Photodynamic therapy](/wiki/Photodynamic_therapy), as well as in *in vitro* cancer research using cell lines.<ref name=foo>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> Further HeLa cells have also been used to define cancer markers in RNA, and have been used to establish an [RNAi Based Identification System and Interference of Specific Cancer Cells](/wiki/RNAi-Based_Identification_System_and_interference_of_Specific_Cancer_Cells).[[23]](#cite_note-23)

## Analysis[[edit](/index.php?title=(none)&action=edit&section=4)]

### Telomerase[[edit](/index.php?title=(none)&action=edit&section=5)]

The HeLa [cell line](/wiki/Cell_line) was derived for use in [cancer research](/wiki/Cancer_research). These cells proliferate abnormally rapidly, even compared to other cancer cells. Like many other cancer cells,[[24]](#cite_note-24) HeLa cells have an active version of [telomerase](/wiki/Telomerase) during cell division,[[25]](#cite_note-25) which prevents the incremental shortening of [telomeres](/wiki/Telomere) that is implicated in aging and eventual cell death. In this way, the cells circumvent the [Hayflick Limit](/wiki/Hayflick_Limit), which is the limited number of cell divisions that most normal cells can undergo before becoming [senescent](/wiki/Senescence).

### Chromosome number[[edit](/index.php?title=(none)&action=edit&section=6)]

[Horizontal gene transfer](/wiki/Horizontal_gene_transfer) from [human papillomavirus](/wiki/Human_papillomavirus) 18 (HPV18) to [human](/wiki/Human) cervical cells created the HeLa genome, which is different from Henrietta Lacks' genome in various ways, including its number of chromosomes. HeLa cells are rapidly dividing cancer cells, and the number of chromosomes varied during cancer formation and cell culture. The current estimate (excluding very tiny fragments) is a "hypertriploid chromosome number (3n+)" which means 76 to 80 total chromosomes (rather than the normal diploid number of 46) with 22–25 clonally abnormal chromosomes, known as HeLa signature chromosomes."[[26]](#cite_note-26)[[27]](#cite_note-27)[[28]](#cite_note-28)[[29]](#cite_note-29) The signature chromosomes can be derived from multiple original chromosomes, making challenging summary counts based on original numbering. Researchers have also noted how stable these aberrant karyotypes can be.[[26]](#cite_note-26)

Human papillomaviruses (HPVs) are frequently integrated into the cellular DNA in cervical cancers. We mapped by [FISH](/wiki/Fluorescent_in_situ_hybridization) five HPV18 integration sites: three on normal chromosomes 8 at 8q24 and two on derivative chromosomes, der(5)t(5;22;8)(q11;q11q13;q24) and der(22)t(8;22)(q24;q13), which have chromosome 8q24 material. An 8q24 copy number increase was detected by CGH. Dual-color FISH with a c-MYC probe mapping to 8q24 revealed colocalization with HPV18 at all integration sites, indicating that dispersion and amplification of the c-MYC gene sequences occurred after and was most likely triggered by the viral insertion at a single integration site. Numerical and structural chromosomal aberrations identified by SKY, genomic imbalances detected by CGH, as well as FISH localization of HPV18 integration at the c-MYC locus in HeLa cells are common and representative for advanced stage cervical cell carcinomas. The HeLa genome has been remarkably stable after years of continuous cultivation; therefore, the genetic alterations detected may have been present in the primary tumor and reflect events that are relevant to the development of cervical cancer.[[26]](#cite_note-26)

### Complete genome sequence[[edit](/index.php?title=(none)&action=edit&section=7)]

The complete [genome](/wiki/Genome) of the HeLa cells was [sequenced](/wiki/Sequencing) and published on 11 March 2013<ref name=Landry>[Template:Cite journal](/wiki/Template:Cite_journal)</ref>[[30]](#cite_note-30) without the Lacks family’s knowledge.<ref name=germanhela>[Template:Cite web](/wiki/Template:Cite_web)</ref> Concerns were raised by the family, so the authors voluntarily withheld access to the sequence data.<ref name=germanhela/> [Jay Shendure](/wiki/Jay_Shendure) led a HeLa sequencing project at the University of Washington which produced a paper that had been accepted for publication in March 2013—but that was also put on hold while the Lacks family's privacy concerns were being addressed.[[31]](#cite_note-31) On 7 August 2013, [NIH](/wiki/NIH) director [Francis Collins](/wiki/Francis_Collins) announced a policy of controlled access to the cell line genome based on an agreement reached after three meetings with the Lacks family.<ref name=helanih>[Template:Cite web](/wiki/Template:Cite_web)</ref> A data-access committee will review requests from researchers for access to the genome sequence under the criteria that the study is for medical research and the users will abide by terms in the HeLa Genome Data Use Agreement, which includes that all NIH-funded researchers will deposit the data into a single database for future sharing. The committee consists of six members including representatives from the medical, scientific, and bioethics fields, as well as two members of the Lacks family.<ref name=helanih/> In an interview, Collins praised the Lacks family’s willingness to participate in this situation that was thrust upon them. He described the whole experience with them as ‘powerful’, saying that it brought together ‘science, scientific history and ethical concerns’ in a unique way.[[32]](#cite_note-32)

## Contamination[[edit](/index.php?title=(none)&action=edit&section=8)]

HeLa cells are sometimes difficult to control because of their adaptation to growth in tissue culture plates. Through improper maintenance, they have been known to contaminate other cell cultures in the same laboratory, interfering with biological research and forcing researchers to declare many results invalid. The degree of HeLa cell contamination among other cell types is unknown because few researchers test the identity or purity of already established cell lines. It has been demonstrated that a substantial fraction of [*in vitro*](/wiki/In_vitro) cell lines are contaminated with HeLa cells; estimates range from 10% to 20%. [Stanley Gartler](/wiki/Stanley_Gartler) (1967) and [Walter Nelson-Rees](/wiki/Walter_Nelson-Rees) (1975) were the first to publish on the contamination of various cell lines by HeLa.[[33]](#cite_note-33) Science writer Michael Gold wrote about the HeLa cell contamination problem in his book *A Conspiracy of Cells*. He describes Nelson-Rees's identification of this pervasive worldwide problem — affecting even the laboratories of the best physicians, scientists, and researchers, including [Jonas Salk](/wiki/Jonas_Salk) — and many possibly career-ending efforts to address it. According to Gold, the HeLa contamination problem almost led to a [Cold War](/wiki/Cold_War) incident. The USSR and the USA had begun to cooperate in the [war on cancer](/wiki/War_on_cancer) launched by President [Richard Nixon](/wiki/Richard_Nixon), only to find that the exchanged cells were contaminated by HeLa. Gold contends that the HeLa problem was amplified by emotions, egos, and a reluctance to admit mistakes. Nelson-Rees explains:

It's all human – an unwillingness to throw away hours and hours of what was thought to be good research...worries about jeopardizing another grant that's being applied for, the hurrying to come out with a paper first. And it isn't limited to biology and cancer research. Scientists in many endeavors all make mistakes, and they all have the same problems.[[34]](#cite_note-34)

Rather than focus on how to resolve the problem of HeLa cell contamination, many scientists and science writers continue to document this problem as simply a contamination issue — caused not by human error or shortcomings but by the hardiness, proliferating, or overpowering nature of HeLa.[[35]](#cite_note-35) Recent data suggest that cross-contaminations are still a major ongoing problem with modern cell cultures.[[3]](#cite_note-3)<ref name=Nardone>[Template:Cite journal](/wiki/Template:Cite_journal)</ref> Taken directly from the International Cell Line Authentication Committee (ICLAC) webpage:

Regrettably, cross-contamination and misidentification are still common within the research community. Many cell lines were cross-contaminated during establishment; this means that all work using those cell lines has incorrectly used the contaminant – which may come from a different species or a different tissue. ... A cell line is considered to be misidentified if it no longer corresponds to the individual from whom it was first established. Many cases of misidentification are caused by cross-contamination, where another, faster growing, cell line is introduced into that culture.[[36]](#cite_note-36)

## New species proposal[[edit](/index.php?title=(none)&action=edit&section=9)]

[Template:Taxobox](/wiki/Template:Taxobox)

HeLa was described by [Leigh Van Valen](/wiki/Leigh_Van_Valen) as an example of the contemporary creation of a new species, dubbed *Helacyton gartleri*, due to their ability to replicate indefinitely, and their non-human number of chromosomes. The species was named after [Stanley M. Gartler](/wiki/Stanley_M._Gartler), whom Van Valen credits with discovering "the remarkable success of this species."[[37]](#cite_note-37) His argument for speciation depends on these points:

* The chromosomal incompatibility of HeLa cells with humans.
* The ecological niche of HeLa cells.
* Their ability to persist and expand well beyond the desires of human cultivators.
* HeLa can be defined as a species as it has its own clonal karyotype.[[38]](#cite_note-38)

Van Valen proposed the new family Helacytidae and the genus Helacyton, as well as proposing a new species for HeLa cells in the same paper.[[37]](#cite_note-37) However, this proposal has not been taken seriously by other prominent evolutionary biologists, nor by scientists in other disciplines. Van Valen’s argument of HeLa being a new species does not fulfill the criteria for an independent unicellular asexually reproducing species because of the notorious instability of HeLa's karyotype and their lack of a strict ancestral-descendant lineage.[[39]](#cite_note-39)

## Additional images[[edit](/index.php?title=(none)&action=edit&section=10)]

[Template:Commons category](/wiki/Template:Commons_category) <gallery> File:HeLa-II.jpg|Multiphoton fluorescence image of HeLa cells stained with the actin binding toxin phalloidin (red), microtubules (cyan) and cell nuclei (blue). Nikon RTS2000MP custom laser scanning microscope. File:HeLa-III.jpg|Multiphoton fluorescence image of HeLa cells with cytoskeletal microtubules (magenta) and DNA (cyan). Nikon RTS2000MP custom laser scanning microscope. File:HeLa-V.jpg|Scanning electron micrograph of just-divided HeLa cells. Zeiss Merlin HR-SEM. File:HeLa cells stained with Hoechst 33258.jpg|HeLa cells stained with [Hoechst 33258](/wiki/Hoechst_stain) File:HeLa Cells Image 3709-PH.jpg|Dividing HeLa cells as seen through a [scanning electron microscope](/wiki/Scanning_electron_microscope) File:HeLa cells stained with antibody to actin (green) , vimentin (red) and DNA (blue).jpg|HeLa cells stained with antibody to [actin](/wiki/Actin) (green), [vimentin](/wiki/Vimentin) (red) and [DNA](/wiki/DNA) (blue). Image courtesy of [EnCor Biotechnology Inc.](/wiki/EnCor_Biotechnology_Inc.) </gallery>

## See also[[edit](/index.php?title=(none)&action=edit&section=11)]

* [Clonally transmissible cancer](/wiki/Clonally_transmissible_cancer)
* [List of contaminated cell lines](/wiki/List_of_contaminated_cell_lines)
* [WI-38](/wiki/WI-38)

## References[[edit](/index.php?title=(none)&action=edit&section=12)]

[Template:Reflist](/wiki/Template:Reflist)

## Further reading[[edit](/index.php?title=(none)&action=edit&section=13)]

* [Template:Cite book](/wiki/Template:Cite_book)
* [Template:Cite book](/wiki/Template:Cite_book)

## External links[[edit](/index.php?title=(none)&action=edit&section=14)]

* [HeLa (CCL-2 Cells)](http://www.lgcstandards-atcc.org/LGCAdvancedCatalogueSearch/ProductDescription/tabid/1068/Default.aspx?ATCCNum=CCL-2&Template=cellBiology) in the [ATCC](/wiki/American_Type_Culture_Collection) database
* [Template:MeshName](/wiki/Template:MeshName)
* [HeLa Transfection and Selection Data for HeLa Cells](http://cell-lines.toku-e.com/Cell-Lines_1434.html)
* [Rebecca Skloot](/wiki/Rebecca_Skloot), [The Immortal Life of Henrietta Lacks](http://rebeccaskloot.com/the-immortal-life/) book website with additional features (photo/video/audio)
* [The Henrietta Lacks Foundation](http://www.henriettalacksfoundation.org), a foundation established to, among other things, help provide scholarship funds and health insurance to Henrietta Lacks's family.
* [Rebecca Skloot](/wiki/Rebecca_Skloot), [Cells That Save Lives are a Mother's Legacy](http://query.nytimes.com/gst/fullpage.html?res=9E01EED9153BF934A25752C1A9679C8B63&scp=1&sq=cells+that+save+lives+are+a+mother%27s+legacy&st=nyt), New York Times
* ["Wonder Woman: The Life, Death, and Life After Death of Henrietta Lacks, Unwitting Heroine of Modern Medical Science"](http://www.citypaper.com/news/story.asp?id=3426) by Van Smith
* ["What's Left of Henrietta Lacks?"](http://www.lrb.co.uk/v22/n08/enri01_.html) by Anne Enright
* ["Culturing Life: How Cells Became Technologies"](http://www.amazon.com/dp/0674023285/) a book by [Hannah Landecker](/wiki/Hannah_Landecker) about HeLa and the history of tissue culture.
* [Discussion about the taxonomic effect of creating the new taxon *Helacyton*.](http://groups.google.com/group/talk.origins/msg/4f10e3a1de883c2a)
* [Cell Centered Database – HeLa cell](http://ccdb.ucsd.edu/sand/main?stype=lite&keyword=hela&Submit=Go&event=display&start=1)
* [Audio Interview with Rebecca Skloot about her book "The Immortal Life of Henrietta Lacks"](http://www.twit.tv/kiki43)
* [Cellosaurus entry for HeLa](http://web.expasy.org/cellosaurus/CVCL_0030)

[Category:Human cell lines](/wiki/Category:Human_cell_lines) [Category:Bioethics](/wiki/Category:Bioethics) [Category:Johns Hopkins Hospital](/wiki/Category:Johns_Hopkins_Hospital) [Category:Cellular senescence](/wiki/Category:Cellular_senescence)