Selection of Tuskegee University as a cell culture factory site

One may ask: what were the probable circumstances that led to the selection of Tuskegee University as the site for a HeLa Project? Since the NFIP desired that the HeLa cell project would conform to established cell culture protocols, its powers-to-be felt that such standards could be best achieved on university campuses, where the personnel would be knowledgeable and experienced in research. Because of the outstanding research conducted by Drs. Brown and Henderson in cell biology, Tuskegee University fit the criteria set by the NFIP. It probably did not hurt Tuskegee’s chances of landing a HeLa Project site that Dr. H.M. Weaver, Director of Research for the NFIP, was well acquainted with the ongoing work taking place in Tuskegee’s Carver Research Foundation. In addition, for many years, Mr. Basil O’Connor, Founder and Chief Administrator of the NFIP, was Chairman of the Board of Trustees of Tuskegee University. O’Connor’s regular presence on Tuskegee’s campus acquainted him personally with the school’s exceptional faculty and research facilities.[4](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4458465/#R4),[5](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4458465/#R5) Still others believe that Mr. Charles Bynum, the Director of “Negro Activities” at the NFIP was the main reason that Tuskegee was selected as a HeLa Project site. It is believed that Bynum, the first Black foundation executive in the United States, preferred Tuskegee because it would provide much-needed funding for jobs and training of Carver Research Foundation fellows and scientists, as well as funding of other research being conducted.[4](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4458465/#R4) Needless to say that all of these factors contributed in part to O’Connor’s selection of, and confidence in Tuskegee to do an exceptional job on the HeLa Project.

In October 1952, Dr. Weaver met with Dr. Russell Brown, Director of the Carver Research Foundation, to discuss the feasibility of a central HeLa production laboratory at Tuskegee University. During these discussions, it was mutually agreed that the project would be awarded to Tuskegee and supported by a grant from the NFIP. Dr. Brown was to serve as principal investigator (PI), with Dr. Henderson as co-PI. Weaver next arranged for both Brown and Henderson to spend three months and six weeks, respectively in an intensive cell and tissue culture training program at the University of Minnesota under the supervision of Drs. Jerome T. Syverton and William F. Scherer. During this training period, Brown and Henderson formulated the equipment, personnel, and facilities infrastructure needed for developing a preeminent cell culture laboratory. All of their requests and specifications were carried out to the letter.[4](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4458465/#R4),[5](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4458465/#R5)

In April 1953, Dr. Scherer provided Tuskegee with the original seed culture of the HeLa cell line, which he obtained from the original propagator of the cell line, Dr. George Gey from Johns Hopkins University Hospital. Drs. Brown and Henderson trained all of their personnel in intricacies of cell and tissue culture. The Tuskegee team was given a goal of developing the capacity to ship a minimum of 10,000 cultures per week to various laboratories. In their original experimentation to identify the best protocol to ensure the successful transportation of viable HeLa cells, the Brown/Henderson team made important findings that revolutionized the process of commercialized cell culture. In the area of laboratory cell and tissue culture material, the HeLa Project was responsible for the routine use of rubber-lined screw-capped bottles and tubes. They also saw the need for specialization in the jobs of their personnel. This was seen in the hiring of what they referred to as an “expediter,” whose sole job was to be responsible for the procurement of necessary supplies. Drs. Brown and Henderson likewise instituted quality control measures through the employment of customary microscopic analyses to check cell morphology and the condition of culture monolayers before shipping.[5](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4458465/#R5)

Several additional key innovations resulted from discovering that HeLa cells were extremely temperature sensitive. The following are some of the most pertinent innovations rendered. In order to ensure that they would have HeLa cells available in the event of equipment failure, Drs. Brown and Henderson decided to equip the laboratory with multiple incubators instead of a single large-capacity incubator. Their thinking behind this was that if one or more of the incubators’ thermostats failed and allowed temperatures to rise to lethal levels for some cells, they would not lose all cultures. The HeLa cells temperature sensitivity also forced the pair to formulate methods to circumvent the extreme temperatures encountered when shipping cells during the summer and winter months. They discovered that by packing one or two cans of Equitherm (i.e., sodium sulfate decahydrate) in each shipping package during the months of April to September, cell cultures were able to be maintained at a desired temperature of below 36° C. Further shipping innovations included the construction of the shipping container. Shipping containers were made of a heavy-duty cardboard box lined with fiberglass-aluminum sheet insulation. These specialized boxes were also equipped with cardboard separators to maintain the cultures in an upright position and to avoid accidental breakage.[5](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4458465/#R5)

Through trial and error, and under intense pressure and scrutiny to perform, the Tuskegee HeLa team solved all of the intricate problems they encountered associated with the mass production of the HeLa cell line, including the maintenance of a noncontaminating environment and instituting exacting quality control measures. At its peak of production, approximately 20,000 tube cultures could be shipped per week. By June of 1955, the Tuskegee HeLa project had shipped approximately 600,000 cultures.[4](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4458465/#R4),[5](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4458465/#R5) In 1954, Microbiological Associates, Incorporated copied the successful template designed at Tuskegee University’s Carver Research Foundation. This template was used to set up a large-scale cell culture factory in a former Fritos factory in Bethesda, Maryland to begin mass-producing HeLa cells for global distribution, simultaneously ushering in a multibillion-dollar industry for the selling of biomedical specimens. The NFIP eventually closed down the Tuskegee HeLa cell factory as a consequence of dwindling demand for cells due to the competition from companies like the Microbiological Associates and other start-ups now supplying scientists with their cell demands.[1](https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4458465/#R1) However, none of these occurrences can diminish Tuskegee University’s importance, its contributions, and impact on two biomedical fronts in the battle against poliomyelitis, for not only Blacks, but for all people.