KOSMOS Vol. 65, 1, 1–10, 2016

THE DISCOVERY OF HELA CELLS: THE BEGINNING OF THE *IN VITRO* RESEARCH REVOLUTION

NATALIA ANNA HARAŃCZYK, EWA AGNIESZKA POCHEĆ

Department of Glycoconjugate Biochemistry, Institute of Zoology, Jagiellonian University, Gronostajowa 9, 30-387 Krakow, e-mail: natalia.haranczyk@student.uj.edu.pl, ewa.pochec@uj.edu.pl

Summary

The history of cell culture dates back to the late nineteenth century when Wilhelm Roux for the first time successfully maintained embryonic chicken tissues in a warm saline and established the principles of cells cultivation *in vitro*. Since that time, scientists have endeavored to keep cells alive *in vitro* as model systems for experimental studies outside the body. From the very beginning it was thought that culturing cells in vitro would give a chance to find answers to many questions concerning cell biology and structure. The first human cell line was obtained in 1951 from a biopsy for cervical cancer detection. George Gey, an employee of Johns Hopkins Hospital in Baltimore, was the creator of the first human line, named HeLa after the patient Henrietta Lacks,. These cells are currently one of the most frequently used cell lines in scientific research. The HeLa cells divide rapidly and their contamination may lead to overgrowth of other cell cultures. Recent studies of the HeLa genome have confirmed the special character of these cells, resulting from altered chromosome number and structural disorder, as well as from altered expression of genes responsible for the metabolic pathways connected with DNA repair and the cell cycle. More than 70,000 articles in various scientific journals have been published on the basis of experiments using HeLa cells. There are over 50 million tons of these cells in laboratories around the world. The HeLa line has contributed to the development of techniques for conservation and culturing of cells. The use of HeLa permitted the discovery of the polio vaccine and the mechanism of HIV infection. The description of the role of HPV in the development of tumors and the discovery of telomerase, both findings made with the use of HeLa cells, have been awarded Nobel Prizes. Without a doubt, HeLa cells have significantly contributed to the advance of science, to reduction of the costs of experiments, and have enabled numerous repetitions of experiments.