

Alterations in lipid and miRNA content in cervical epithelial cell lines

Katarzyna Sitarz

Katarzyna Sitarz Jagiellonian University, Poland



Abstract

Cervical cancer is the fourth most common cancer among women. Scientific data show the coexistence of cancer with HPV infection in more than 99% of cases. In previous studies of cervical epithelial cells using Raman microscopy and molecular methods, we have proved that pathological changes are associated with changes in glycogen and lipid metabolism¹⁻². The methylation of the SREBF1 gene and the copy number of the mitochondrial genome are also related to these changes.

In this experiment, we used cervical cancer cell lines differing in HPV-16 infection status and the number of HPV genome copies per cell: CaSKi (HPV-16-positive; high copy number), SiHa (HPV-16-positive; low copy number), C33A (HPV-16-negative) and HaCaT cells as a control (keratinocytes). The methods used were Raman microscopy, to visualize and calculate the content of biocompounds in cells³⁻⁴, and qPCR, to determine the level of miRNAs (miR-124, miR-143, miR-199a) that are associated with cancer and lipid metabolism. The aims of the research were to determine the relationship between miRNAs and changes in the metabolism of cervical epithelial cells and their relationship with cancer.

The results showed that the C33A cells have the highest lipid content. This is correlated with the increased level of miR-124, which is responsible for inhibiting beta-oxidation. On the other hand, both, miR-143 and miR-199a exhibit the highest levels in normal cells (HaCaT), which may indicate their effect on inhibiting cell division and promoting apoptosis. An interesting observation is the statistically significant highest content of triacylglycerols in the lipid droplets of SiHa cells. This research, and its follow-up in the future, may shed more light on miRNA involvement in cancerogenesis.

Biography

Katarzyna Sitarz, MSc graduated in biochemistry at the Faculty of Biochemistry, Biophysics and Biotechnology of the Jagiellonian University. Currently, she is finishing interdisciplinary PhD studies at InterDokMed, during which she combines the fields of medical microbiology and chemistry. Katarzyna Sitarz's doctoral thesis concerns genetic, epigenetic and phenotypic changes in the cervical epithelium related to infection with highly oncogenic types of HPV and the impact of these changes on cancer formation.

