



RESEARCH PROJECT Z3-4522

Establishment and characterization of a novel human stromal cell line of peritoneal endometriosis

Principal investigator: Maja Pušić Novak

Funding: 1. 10. 2022 - 30. 9. 2024

Researcher: [SICRIS](#)

Project description:

Endometriosis is a female gynecological disorder defined by the presence of endometrial tissue outside the uterus cavity. This complex, estrogen-dependent and inflammatory disease affects approximately 190 million women worldwide. Despite the high prevalence and high cost of endometriosis, research into this disease remains underfunded, and the problems of unknown etiology, delayed diagnosis, and lack of appropriate treatment remain unresolved. New experimental models of endometriosis are needed to better understand the pathophysiology of endometriosis and to find new diagnostic and treatment options for this debilitating disease. The typical endometriotic lesion is histologically defined by the presence of epithelial glands and endometrial-like stroma. Because primary endometriotic cells have a limited lifespan, several immortalized cell lines have been created so far. However, currently available endometriotic cell lines are predominantly epithelial cells derived from ovarian endometriomas. The present project focuses on the establishment and characterization of a novel stromal cell line of peritoneal endometriosis. To achieve this, the isolation and cell culturing of endometriotic primary cells will be optimized. After isolation, the purity of primary cell cultures will be determined using cell type-specific markers. The human telomerase reverse transcriptase (hTERT) plasmid will be applied for the creation of immortalized stromal cell line. The following characteristics of both the primary cells and the immortalized cell line will be assessed: viability, population doubling, cell migration, absence of cell senescence, absence of mycoplasma in the cell culture medium, expression of morphological markers and estrogen associated genes. In addition, genomic stability will be determined by karyotype analysis and genetic authenticity by STR analysis of the immortalized cell line. By establishing a well characterized cell line, we expect to obtain a powerful experimental tool to study endometriosis at the cellular level. This novel in vitro model of peritoneal endometriosis may be potentially valuable for drug screening or biomarker discovery.

Keywords: endometriosis, stromal cell line, immortalization, hTERT

The phases of the project and their realization:

Months 1-9:

- collection of tissue samples from patients with peritoneal endometriosis
- optimization of the protocol for isolation of primary cell cultures of peritoneal endometriosis

Months 5-9:

- analysis and characterization of isolated primary cell cultures of peritoneal endometriosis

Months 9-18:

- optimization of protocols for immortalization of primary stromal cells of peritoneal endometriosis
- establishment of a new human stromal cell line of peritoneal endometriosis

Months 16-24:

- analysis and characterization of the established stromal endometriotic cell line

Bibliography: [SICRIS](#)