Charles University

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Title of diploma thesis: Effect of adenosine on the proliferation of JEG-3 cell line

Adenosine is a purinergic signaling molecule that is used in nucleic acid synthesis. Transport of hydrophilic nucleosides through the plasma and/or organelle membranes is provided by equilibrative nucleoside transporters (ENTs), members of the SLC29A transporter family, and concentrative nucleoside transporters (CNTs), members of the SLC28A transporter family. The placenta is a complex and rapidly growing organ. It shows some patterns similar to tumors except for the fact that the placenta's growth is fully controlled. It was found that extracellular nucleosides support the proliferation of cancerous and some non-cancerous cells. The placenta expresses high levels of NTs which indicates the placenta's ability to take up the nucleosides from circulation, however, the contribution of this process to placental growth is known.

The diploma thesis aims to test the effect of adenosine and other nucleosides on trophoblast proliferation. We evaluated whether adenosine and other nucleosides increase the proliferation of the choriocarcinoma-derived JEG-3 cell line. We analyzed cell proliferation using methods i) CCK-8, ii) Click-It EdU, iii) CyQuant, and iv) analysis of proliferation marker *MKI-67*.

We have shown the effect of adenosine and other nucleosides on the proliferation of JEG-3 cells. Therefore, this diploma thesis helps to understand their mechanism of proliferation. In the future, the results should be confirmed in explants known to maintain the ability to proliferate.