

# ABSTRACT

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**Title of diploma thesis:** Effect of fern extracts on the SW480 cell line

Cancer is one of the leading causes of death in the world. Although we have several drugs available for the treatment of cancer, none of them are completely effective and safe. The fundamental problem is toxicity, which experts try to eliminate by looking for other treatment alternatives like plants and their secondary metabolites with antiproliferative and antioxidant effects against free radicals, that can cause cancer. Our work is focused on the antioxidant, as well as the prooxidant effect of 4 species of ferns (*Athyrium filix - femina*, *Dryopteris dilatata*, *Dryopteris borrieri*, *Blechnum spicant*), whose extracts of different concentrations were studied as potentially beneficial substances against *oxidative stress* on the SW480 cell line. We used the fluorescent probe H<sub>2</sub>DCF-DA to detect the production of reactive oxygen species (ROS) in cells. In the initial setup the potential prooxidant effect was monitored alongside with the tert-butyl hydroperoxide solution as a positive control. The results demonstrated that these test substances did not induce the ROS production. The second experiment was focused on the potential antioxidant effects. The positive controls Catechin and Quercetin together with the fern extracts were added at the beginning, as an 18-hour pretreatment in order to prepare the cells for oxidative stress by inducing antioxidant enzymes. We achieved a significant antioxidant effect of *Dryopteris dilatata* extract (100 µg/ml). The others do not affect the production of ROS this way, on the contrary some of them depleted the antioxidant apparatus of cells, as was shown by higher intensity of fluorescence. Although some substances have shown antioxidant activity, the experiment cannot be considered as definitive. Further targeted research is needed.