and even antagonism depending on the concentrations associated. Results allow in a future their association at some concentrations to increase antioxidant effects.

87. (321) **POLYPHENOLS FROM ANDEAN POTATO INDUCE CITOTOXICITY IN GLIOBLASTOMA CELLS BY MODIFING THE REDOX STATUS**

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Andean potatoes (*Solanum tuberosum* ssp. *andigena*) are a good source of dietary polyphenols, such as chlorogenic acid and anthocyanins. This study aimed to analyze the cytotoxic activity of polyphenols from Andean potato var. Santa María on glioblastoma cells. In order to test this, we first assayed the cell viability by incubating different concentrations of polyphenol extracts with human glioblastoma LN-229 cells. We observed that polyphenols induced changes in the morphology of the cells and reduced the viability in a concentration-dependent manner. Then, we calculated the CC_{50} (50% cytotoxic concentration) of total polyphenols extract and proceeded to investigate how the cells dye. First, we treated the cells with the CC_{50} for 4 hr and measured the intracellular reactive oxygen species (ROS) using the probe H_2DCFDA. At the beginning of treatment, the ROS levels decreased compared to control, but after 2 hr, they increased, suggesting that the polyphenols altered the redox homeostasis in glioblastoma cells. To analyze what happens in the mitochondria, we determined the potential mitochondrial membrane with Rhodamine 123. After 3 hr of treatment, we observed a significant decrease, confirming that polyphenols would induce a dysfunction in the mitochondria that contributes to increased ROS levels. Finally, we performed a DAPI staining of cells' nuclei and visualized them with fluorescence microscopy, observing significant alterations in treated cells such as bright nuclear condensation and, in some cases, fragmented nucleus. However, we checked the genomic DNA fragmentation in agarose gel, and we determined that polyphenols produced a slight reduction in genomic DNA size with a lack of oligonucleosomal fragments, suggesting the activation of a mechanism of death caspase-independent. These findings demonstrated that polyphenols from Andean potato var. Santa María would be a good source of bioactive compounds with anti-glioblastoma activity that impacts human health.

88. (339) **HISTOPATHOLOGICAL EVALUATION OF THE EFFECT OF CARROT FIBER ON THE STOMACH OF RATS**.

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Dietary fiber intake elicits a wide range of physiologic effects, not just locally in gastrointestinal tract, but systemically. These changes can then alter the physiology of the body's other nutrient management and detoxification organs, such as the liver and kidneys. Nevertheless, establishing the source of origin, type, and dose of dietary fiber inclusion is importance to obtain the above-noted benefits. A study was conducted to investigate the effect of carrot fiber isolated on stomach histomorphology, in rats. The fibers were obtained from discards from carrot production. Twelve conventional Wistar rats were fed fibre-free or fibre supplemented diets (90 days), and their stomach were examined by optical microscopic. Fixed tissue samples were processed, and embedded in paraffin. Sections of 5 - 6 µm thick, were cut using a rotary microtome. Slides were routinely stained with Hematoxilyn & Eosin. Postmortem alterations such as gland dilatations with epithelial elongation and dysplasia in the mucosa of the stomach were observed, in supplemented rats. These results indicate that carrot fiber may have an effect on rat stomach, which may have health implications.

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89. (187) **REPLACING GLUCOSE MEDIA WITH GALACTOSE TO EVALUATE MITOCHONDRIAL TOXICITY OF IMIQUIMOD.**

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The off-label use of imiquimod (IQ) for hemangioma treatment has shown clinical benefits. We have previously reported a selective direct IQ-cytotoxic effect on transformed H5V endothelial cells (EC) (hemangioma model) vs normal 1G11 EC. We observed a severe imbalance in antioxidant defense and apoptosis in H5V but not in 1G11. To further address this issue, we studied the possibility of IQ being a mitochondrial toxicant. H5V and 1G11 cells were treated with IQ (0-50 μg/mL) for 2, 4, 12 or 24 h and analyzed for reactive oxygen species (ROS) with $DCFH_2$-DA probe and mitochondrial stress by MitoTracker™ Red CMXRos fluorescence. Viability assays were performed using the standard culture medium with 5.5 mM glucose (regular) or media containing 25 mM glucose (high) or 25 mM galactose (depleted). IQ treatment increased ROS level in H5V after 2 h (35-60%; $p<0.05$) but in 1G11 only at 4 h (50%; $p<0.05$). Mitochondrial membrane potential in H5V cells was affected after 4 and 12 h treatment, revealed by a decreased in MitoTracker fluorescence (≈50%; $p<0.05$). In contrast, 1G11 cells were unaffected and only presented a significant 30%-decrease in fluorescence after 12 h with 50 μg/mL IQ ($p<0.05$). Cells grown in a high glucose medium can adapt to a glycolytic phenotype. By assessing the effect of IQ in this medium, both cell lines became significantly less affected than with the regular culture medium. On the contrary, by forcing cells to respiration with galactose instead of glucose-containing medium, IQ treatment enhanced cell death in both cell lines, being fully cytotoxic for H5V ($p<0.05$) but leaving ≈32% 1G11 cells still alive at the highest IQ concentrations.
These results provide more evidences about the higher susceptibility of transformed EC to IQ, where an early ROS production and mitochondrial dysfunction drove H5V cells to death. By shifting cells towards diminished respiration in absence of glucose, we proved IQ acts as a mitochondrial toxicant in both EC lines.

90. (249) **BEHAVIORAL AND MOLECULAR BASES OF THE ANTHELMINTIC ACTIVITY OF ESSENTIAL OILS EXPLORED IN THE NEMATODE *CAENORHABDITIS ELEGANS***

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Control of helminth infections in both human and veterinary medicine currently relies mainly on chemotherapy, but acquisition of resistance is an increasing problem that leads to the urgent need of discovery of novel drugs. *C. elegans* has demonstrated to be a model system for the discovery of new anthelmintics and for characterizing their mechanisms of action and resistance. Essential oils (EOs) are natural products produced by aromatic plants. We perform paralysis assays of wild-type and mutant *C. elegans* strain to identify EOs with potential anthelmintic activities, reveal the active components, their target sites, and mechanisms of action. We found that EOs belonging to different orders produce rapid paralysis of *C. elegans* with EC50 values between 0.02-2 % EOs. All EOs tested also inhibited egg hatching, a property related to anthelmintic ability. Thus, EOs mediate both rapid and long-term anthelmintic effects. We examined anthelmintic properties of terpenoids and phenylpropenes and determined that all compounds tested produce both paralysis and egg-hatching inhibition. By testing mutant worms, we identified the muscle L-AChR and GABA receptors as EOs and trans-cinnamaldehyde (TC, phenylpropene) targets. Thus, by mod-