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Abstract P-1084: Promising cytotoxic activity profile of fermented wheat germ extract (Avemar®) in human cancer cell lines

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Avemar® is a fermented wheat germ extract with potent antimetastatic, antiproliferative and immunomodulatory activities. Chemically, it is a complex mixture of biologically active molecules including 2-methoxy-p-benzoquinone and 2,6-dimethoxy-p-benzoquinone which were supposed to be responsible for the main biological properties of Avemar. Despite its ubiquitous use as nutrition supplement for cancer patients in some countries only limited data are available on its activity in human cancer or in combination with chemotherapy. Aim of this study was to investigate the potential activity of Avemar in a panel of human cancer cell lines including colon, testis, thyroid, ovary, NSCLC, breast, gastric, Head and Neck, hepatoma, glioblastoma, melanoma, cervix and neuroblastoma and to rule out antagonism with conventional chemotherapy. To assess the cytotoxic activity of a 96 h continuous drug exposure of Avemar alone or in combination with 5-FU, oxaliplatin or irinotecan the sulforhodamine B assay was used and drug interaction between Avemar and cytostatic drugs was analyzed by the method of Drewinko. IC50 of Avemar ranged from 0.038 mg/ml to 0.7 mg/ml with a median IC50 of 0.33 mg/ml. The highest activity was found in neuroblastoma cell lines with an average IC50 of 0.042 mg/ml. Of note, the 8 colon cancer cell lines included in this screen had a very narrow IC50 range ranging from 0.3 mg/ml to 0.54 mg/ml.

Parallel drug treatment with Avemar and either 5-FU, oxaliplatin or irinotecan in colon cancer cell lines exerted additive to synergistic effects for all drugs with the highest degree of synergy found for combinations of Avemar with 5-FU. No antagonistic drug interaction was observed. Currently, the relevance of sequential treatment for drug combinations with Avemar is analyzed in colon cancer cell lines and the potential differentiating property of Avemar is investigated in testicular cancer cell lines using cellular morphology and Oct-4 protein expression as marker for differentiation.

In conclusion, Avemar possesses broad spectrum preclinical antineoplastic activity and additive to synergistic drug interactions were observed for combinations with irinotecan, oxaliplatin and 5-FU in colon cancer cell lines.

Further evaluation of Avemar as potential anticancer agent seems warranted. Combined treatment of colorectal cancer patients with irinotecan or oxaliplatin containing regimens and Avemar seems feasible with respect to drug interaction on the cellular level.

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