

POSTER PRESENTATION

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Cytotoxic effect induced by combination of polyamines metabolites and endocannabinoid, anandamide, on human cancer cells: a new anticancer strategy

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Polyamines are necessary for cell proliferation and are detected at higher concentrations in most tumor tissues. Bovine serum amine oxidase (BSAO) can generate *in situ* cytotoxic products such as H₂O₂ and aldehydes from oxidation of polyamines, as a new approach in cancer therapy [1]. The present results show that multidrug-resistant human colon adenocarcinoma cells (LoVo) are significantly more sensitive than corresponding wild-type cells to the cytotoxic products. Pre-treatment of the cells with anandamide (AEA) (Figure 1), an endocannabinoid which effect can be either central, in the brain, mediated by CB₁ receptors, or peripheral in other organs and tissues where CB₂ receptors are expressed, sensitized both cell lines to the subsequent exposure to spermine metabolites amplifying the ability of these products to induce cell death [2].

The sensitizing effect was also greater on multidrug-resistant cells than wild-type ones, an aspect of particular importance since conventional cancer therapy suffers

from the development of drug resistance. Cell viability was determined using MTT assay [3]. Concentrations 0–100 μM of AEA were tested, for incubation times up to 24 h; and concentrations 0–8 μM of spermine in presence of BSAO were used, for incubation times up to 1 h.

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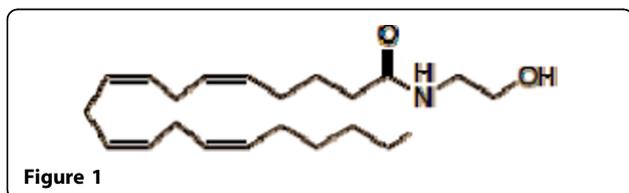
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References

1. Agostinelli E, Tempera G, Viceconte N, Saccoccio S, Battaglia V, Grancara S, Toninello A, Stevanato R: **Potential anticancer application of polyamines oxidation products formed by amine oxidase: a new therapeutic approach.** *Amino Acids* 2010, **38**:353-368.
2. Patsos HA, Hicks DJ, Dobson RR, Greenhough A, Woodman N, Lane JD, Williams AC, Paraskeva C: **The endogenous cannabinoid, anandamide, induces cell death in colorectal carcinoma cells: a possible role for cyclooxygenase 2.** *Gut* 2005, **54**:1741-1750.
3. Supino R: **MTT assays.** *Methods Mol Biol* 1995, **43**:137-49.

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