

# Research Project of Anticancer Compounds Contain Amino acids, Vitamins and Flavonoids



**Mohammad Aldajani\***

Department of Medicinal Chemistry, India

Submission: September 10, 2017; Published: September 19, 2017

\*Corresponding author: Mohammad Aldajani, India; Tel: 248-797-0538; Email; m\_aldajani@yahoo.com

## Introduction

Synthesized the following anti-cancer agents which gave positive tests with Topoisomerase kits. Studied these compounds further by using

1. HT-29, (Human Colon cancer cells)
2. CaOV (Ovary cancer cells)
3. T-47D (for ER-Positive breast cancer cells) and MDA - MB-231 (for ER- negative Breast cells cancer).

Chrysin was used as a positive control for this study. All of them showed different Selectivity's with different concentrations.

- a) Tested some of these compounds in Karmanos Cancer

Center in Michigan against 1- human pancreatic cancer (BxPc-3) 2- Pancreas protein 1 (PANC1).

- b) Examined the Toxin for these compounds by injecting the mice two times with 70 mg/kg intravenously and none of the mice died.

c) The results clearly show that these compounds are very promising and selective candidates as anti-cancer agents. All these compounds can dissolve in water.

d) Next step is to develop new compounds based on experience as designing compounds using Protein-Ligand docking which will have better selectivity and activity.

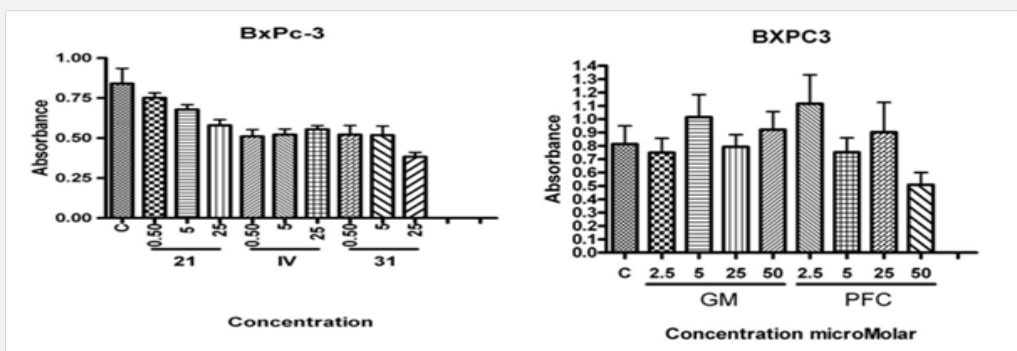


Figure 1: Examined the Toxin for these compounds by injecting the mice two times with 70 mg/kg intravenously and none of the mice died.

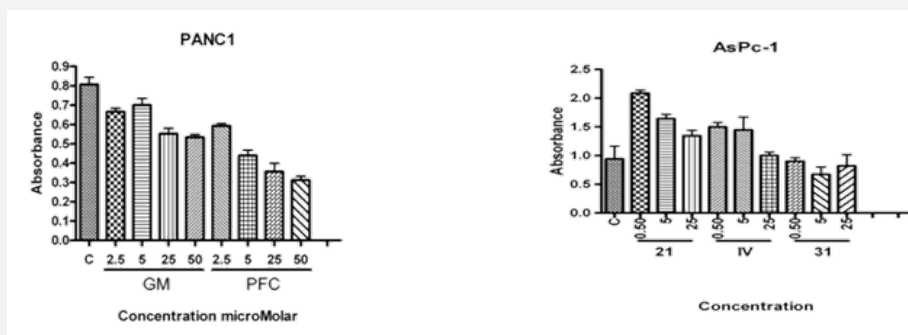


Figure 2: AsPc-1 Use of pancreas-specific antigen in immunodiagnosis of pancreatic cancer.

The same compounds are re synthesized in Kamran's Cancer Center in Michigan, And tested against human pancreatic cancer (BxPc-3) and pancreas protein 1 (PANC1). Examined the Toxin for these compounds by injecting the mice two times with 70 mg/kg intravenously and none of the mice died (Figure 1) & (Figure 2).

a) The results clearly show that these compounds (31, PFC) are very promising for selected candidates as anti-

cancer agents.

b) These compounds kill more than 50% of the cancer cells at low concentrations 50µ/L.

c) Study found that the compounds was not toxic at 70mg/Kg and mice did not die at this concentration when injected tow times.

These compounds can dissolve in water (Figure 3).

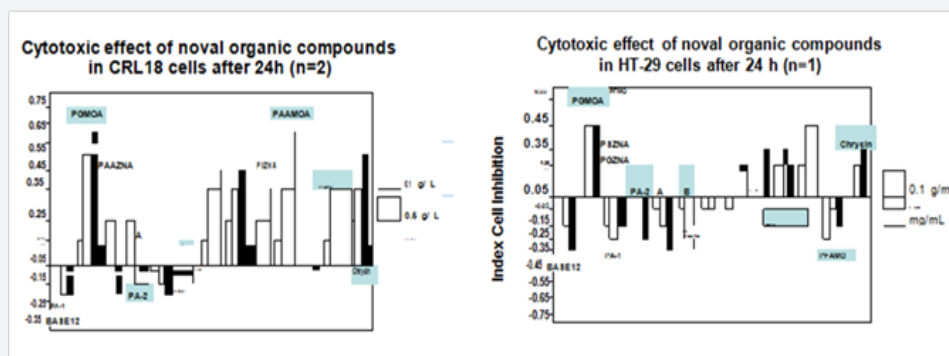


Figure 3: Synthesis Result for Normal Colon Cells FHC or CRL-1831& Human colorectal cancer cell line HT-29.

**Compounds synthesis for colon cancer:** (Table 1).

Table 1: Synthesis Result for the compounds was examined for their cytotoxic effects on human breast tumor cell lines, T-47D.

No.	Types of treatment	pH/color	Remarks	Observation of normal colon cells (CRL18) under micro scope after treatment [2]	Observation of cancer colon cells(HT29) under microscope after treatment [2]	Remarks
1	PA-2	Acidic\ Drak brown	Compound can be tried at concentration of 5 L.	Showed inhibitory effects at concentration of 25 L and above.	Inhibitory effect shown when the cells were applied with all concentration. little contamination of the compound shown	Compound past normal cells test compound can be tried at the concentration of 5 L.
2	B	Light green	This Compound can be tried at concentration of 5 L.	Compound has little effects at concentration of 25 L and above after treatment.	Inhibitory effects shown when the cells were applied at all concentration. Got contamination of compound shown.	Compound past normal cells test compound can be tried at the concentration of 5 L.
3	PFAMO	Acidic\ Dark brown	This Compound can be tried	The compound showed little inhibitory effects at concentration of 50 L after treatment. The compound sterility must be improved.	Potent inhibitory effect shown at all concentration when the cells were applied with the compound. Contamination of the compound shown.	Compound past normal cells test compound can be tried at the concentration of 5 L.
4	PAAMOA	Acidic\ Brown	Compound can be tried	Compound has little inhibitory effect at concentration of 50 L after treatment.	Inhibitory effect show at all concentration when the cells were applied with the compound. Little contamination of the compound shown.	Compound past normal cells test compound can be tried at the concentration of 5 L.
5	chrysin	Light yellow	Compound can be tried at low concentration	Compound has inhibitory effect at concentration of 25 L after treatment.	Potent inhibitory effects at all concentration when the cells were applied to the compound. little contamination shown	Compound past normal cells test compound can be tried at the concentration of 5 L.

## Result

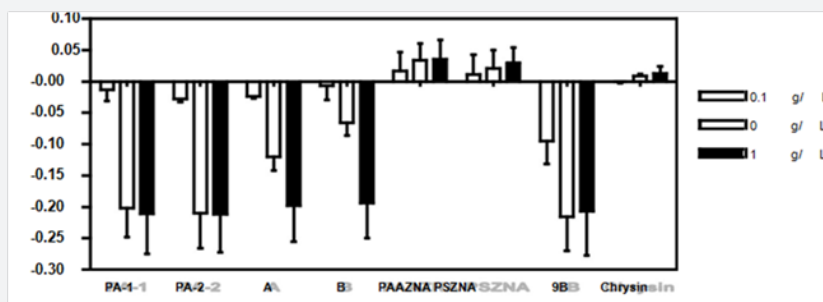


Figure 4: Cytotoxicity of novel compounds in T-47D cells (Day 1 Treatment).

(Figure 4).

a) Preliminary screening showed only PAAZNA, PSZNA and chrysin have cytotoxicity effects on T-47D.

b) Compounds PAAZNA and PSZNA emerged as the most active compound of the series in T-47D cells.

c) Particularly potent against T-47D cells when compared to chrysin.

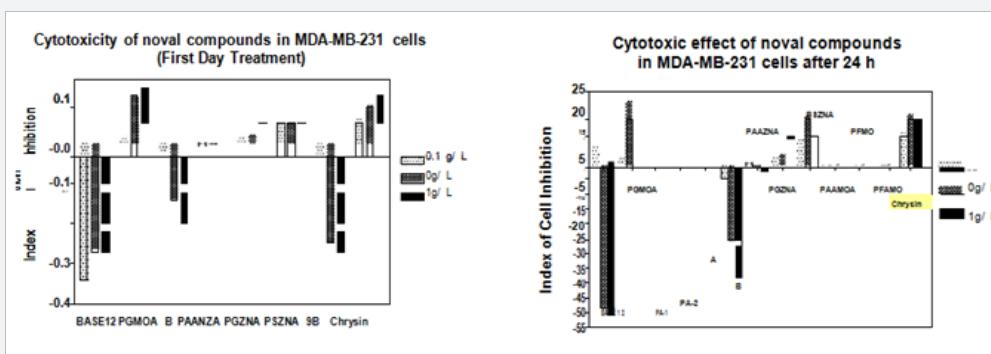


Figure 5: Synthesis Result for the compounds Invasive ductal carcinoma MDA-MB-231.

d) Remaining compounds examined were not showing any cytotoxic effect on the cell line (Figure 5).

I. Preliminary screening showed only PGMOA, PSZNA and Chrysin have Cytotoxicity effects on MDA-MB-231.

II. The term half maximal effective concentration (EC50) refers to the concentration of a drug, antibody or toxicant which induces a response halfway between the baseline and maximum after a specified exposure time. It is commonly used as a measure of drug's potency.

### Determination of EC50 value(s) in MDA-MB-231: (Figure 6) and (Figure 7).

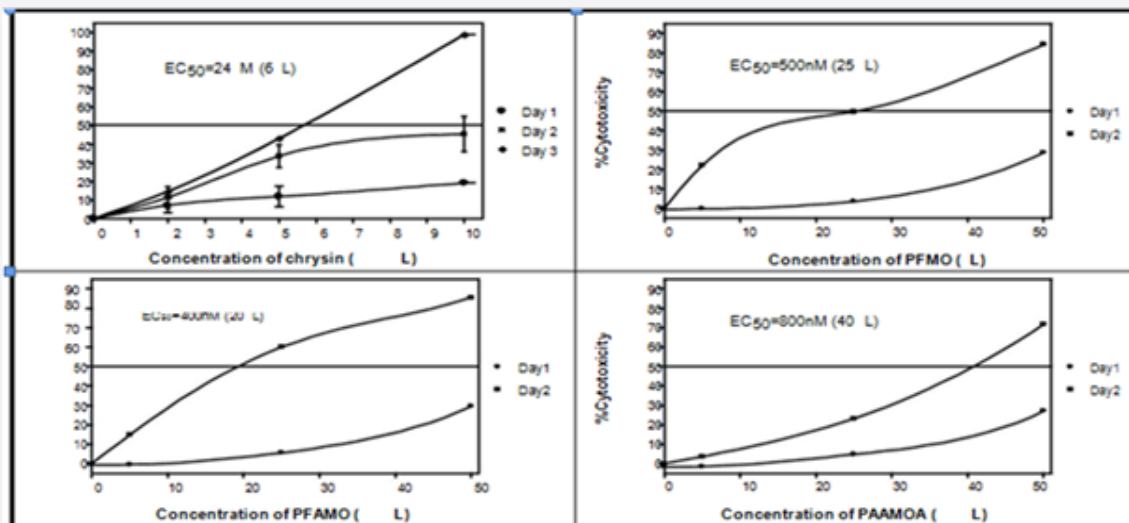


Figure 6: Determination of EC50 value(s) in MDA-MB-231.

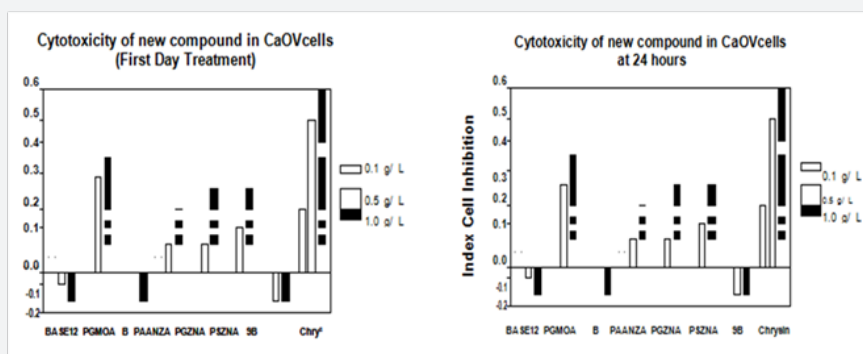


Figure 7: Synthesis Result for compounds Ovary cancer cells CaOV.

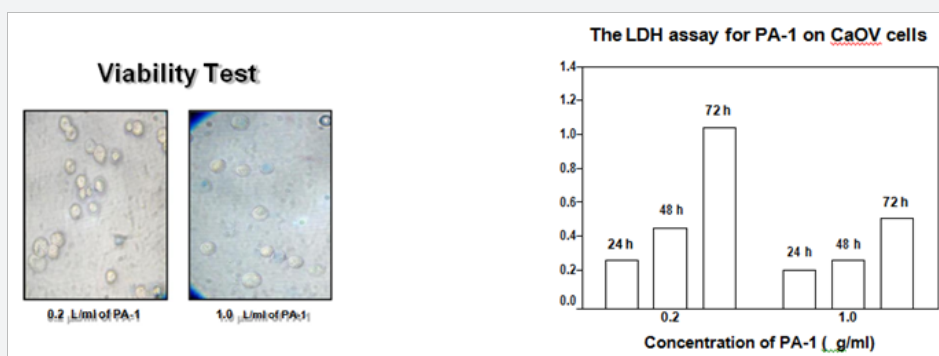


Figure 8.

Trypan blue assay (viability test) dead cells are shown as blue color under a microscope but live cells are excluded from the stainin, LDH (lactate dehydrogenase) assay Determine the

soluble cytosolic enzyme that is released into the culture medium following cell death resulting from either apoptosis or necrosis can be used as an indicator of cell membrane integrity (Figure 8).



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doi: 10.19080/OMCIJ.2017.03.555621

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