نجربة تلميذ مبدع

Thesis of
Now, it's possible

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◙ **الملخص العربي:**

يعد السرطان من أكثر الأمراض التي تفتك بحياة آلاف بل ملايين البشر كل عام بأشكاله وأنواعه العديدة على مستوى العالم حتي وإن تم علاج المصاب به سواء بالعلاج الكيميائي أو الجراحي (استئصال الورم نفسه) ، فإن له أعراضًا جانبية تؤذي باقي أعضاء الجسم، ويعد سرطان الثدي من أكثر الأنواع انتشارا وبخاصة في مصر.

ويهدف هذا المشروع إلى استخدام مجموعة فعالة من خير مواد الطبيعة بحيث لا يمكن أن تؤثر على المريض بشكل أو بآخر، والتى أثبتت فعاليتها من خلال عدة أبحاث عالمية، ولا يوجد لها أعراض جانبية ، وتكوّن المشروع من جزأين: الأول تهيئة جسم المريض للعلاج، والثاني استخدام المواد الطبيعية الفعالة ، وقد تم تجريب المواد فعليًّا في المعامل المتاحة سواء كانت معمل المدرسة أو معمل جامعة أو معمل تحاليل خارجي؛ وذلك لضمان الدقة، وتراوحت مدة العلاج بين شهر إلى ثلاثة أشهر على حسب حالة المريض ومدى تطور الورم .

◙ **Purpose:**

Human body contains millions of cells; it grows divides and dies in conventional manner. Sometimes the system goes wrong, and uncontrolled no of cells grows, which leads to cancer. The cancer cells combine and form extra mass tissue known as tumor. Cancer is one of the leading causes of death worldwide. Globally, it's estimated that 100 million people across the world had any of the forms of cancer in 2017. This number has more than doubled since 1990 when an estimated 45 million had cancer. Globally, about 1 in 6 deaths is due to cancer. There are two types of treatment for cancer (Chemotherapy - radiation therapy). These ways don't affect cancer cells only, they also have bad effects on the other normal cells.

Chemotherapy can cause damage to organs such as the liver, kidneys, heart and lungs. Radiation Therapy While it destroys cancer, it also burns, disfigures and damages healthy cells, tissues and organs. When the body contains a huge burden of toxins as a result of chemotherapy and radiation, this leads to the destruction of the immune system, and therefore a person can undergo many types of infection and complications. So, our solution concentrate on these points because it is a treatment for cancer from natural materials (parthenolide – α-lactalbumin (alpha lactalbumin) – Boswellic acid) to decrease the side effects on the healthy cells with high efficiency on the cancer cells.

◙Background research:

As all scientists search about treatments for cancer all the time. We see what they found, and we started working on the negatives of other treatments and try to solve it.

There are many types of cancer treatment, such as chemotherapy – radiation therapy – surgery. Each one of these has negatives.

◙1)Chemotherapy:

chemotherapy is one of the most common and most powerful forms of cancer treatment. But chemotherapy does a lot more than get rid of cancer. While these drugs are powerful enough to kill rapidly growing cancer cells, they also can harm healthy cells. This may cause several side effects. Chemotherapy drugs can affect any body system, but the following are most susceptible: 1) digestive tract 2) hair follicles

3) bone marrow 4) mouth 5) reproductive system

◙2)Radiation therapy:

The side effects of radiation therapy depend on the area of the body that receives radiation. Early side effects happen shortly after you receive radiation therapy. Late side effects can happen months to years after you receive radiation therapy. Late side effects of radiation therapy …0may be permanent. Early and late side effects may include any of the following:

1)Fatigue or loss of energy 2) Pain in the area of the body that is being treated 3) Skin changes such as a sunburn or red skin 4) Hair loss in the area receiving radiation

◙3)surgery:

When used to treat cancer, surgery is a procedure in which a surgeon removes cancer from your body. Cancer surgery, like all cancer treatments, has benefits, risks, and side effects.

Common side effects of cancer surgery:
1)Pain. 2) Fatigue. 3) Appetite loss 4) Lymphedema

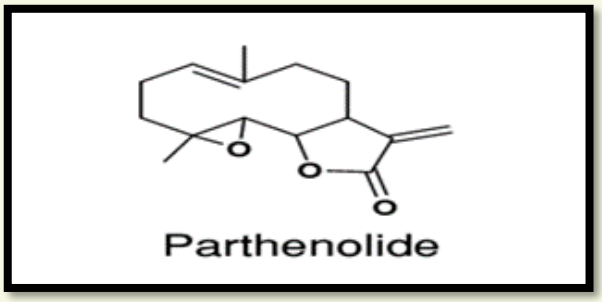
Hypothesis:

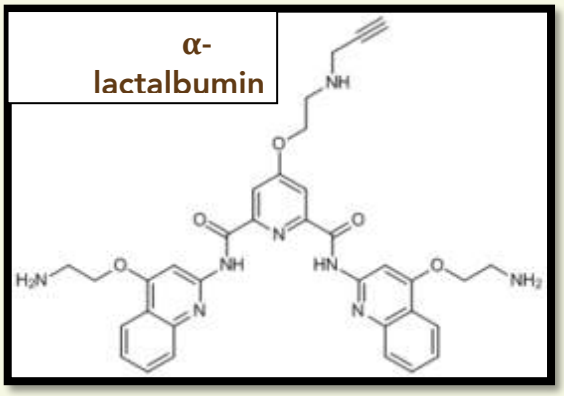
construct a judgment on any scientific project, you must have a prior knowledge about its scientific bases which prove the hypothesis of the project under experiment:

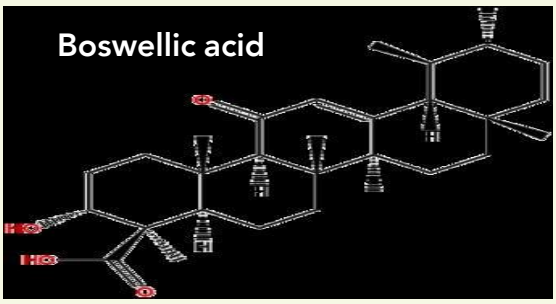
- Natural materials have less side effects than others.
- The mixture of these materials doesn't affect on their properties.
- The concentration of each material determines how this material will affect on the experiment.

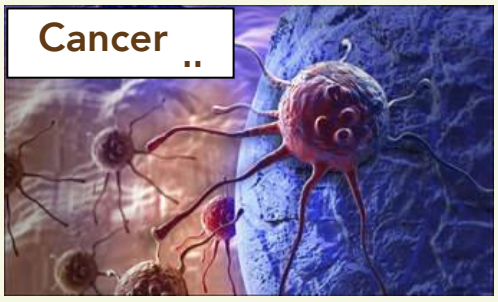
Materials:

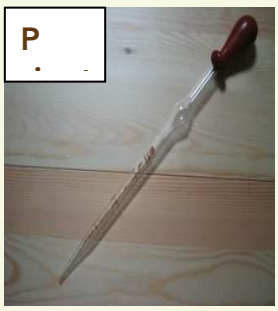
Parthenolid compound	Boswellic acid	pipet	burette
α-lactalbumin (alpha lactalbumin)	Cancer cells (clone cell line, breast cells)	Tubes	Gloves, googles and lab coat

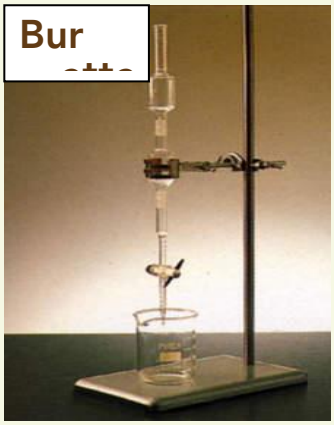












Procedure:

After searching and collecting the required data, we started to apply this project and convert it from just theoretical hypotheses to real effective application.

Our steps:

1- we convert Boswellic acid from solid form to oil.

2- We extracted α-lactalbumin (alpha lactalbumin) compound from animal milk. 3- parthenolid compound is found in Chrysanthemum plant but we buy it from sigma company to save time.

4- we bring colon cell line and breast cells to do the experiment on them.

5- We started to inject cancer cells gradually by specific concentrations and for specific periods.

6- we waited 17 days to see the results of our steps.

7- we did the same steps for three trials with different specific concentrations and noticed the difference between them.

Variables:

This project is working by the natural resources and their effects. There are many variables can affect the quality of the project with negative and positive impacts.

The concentration of each material is the common factor that determines if our materials will be effective or not. We use a specific concentration in our experiment. If this concentration changes it will affect on the quality of the project and other cells.

Data analysis:

Finding a highly efficient, natural cancer cure without side effects on the rest healthy cells will be the appropriate solution for cancer treatment around the world. since all cancer treatment methods (Chemotherapy - radiation therapy) depends on chemicals and compounds that fight the both groups of cells the healthy cells and the cancer cells so our solutions avoid these points and use natural materials with properties by mechanism that can`t harm the cell cycle of healthy cells and target only the tumor. Our project is divided into two main parts first is the preparation second the treatment

First preparation: -

The patient goes through some natural steps to be eligible for the second stage :1-The patient refrains from sugar and salt

2-Refrain from eating red meat, and it is best to replace it with fish

3- He walks on a diet of 80% of vegetables and juices, a few fruits and 20% of legumes.

4- Eat fresh fruits and drink vegetables.

5- Avoid coffee, tea and chocolate.

6- Exercise and breathe deeply.

Second the treatment by injecting the following materials: -

1) Boswellic oil:

Boswellia serrata, or Frankincense resins are harvested from deep incisions made into the tree trunk of Boswellia species and this process causes the tree to 'bleed' a milky white substance that cure the wound to prevent infection The gum resin of Boswellia serrata, frankincense, has a number of components including oils, [α-Thujene], terpinols, monosaccharides and most importantly terpenes. The bio- active PT‟s exhibit a variety of profound effects such as being anti-inflammatory, anti-nociceptive, anti-oxidant, anti- bacterial, cancer drug sensitizing, cardio-protective and insulin resistance lowering Both BSE and 3-OAβBA were found to be effective against triple-negative breast .Boswellia acids may also prevent the formation of DNA in cancerous cells, which could help limit cancer growth because it increase the acids in the breast fluid and the cancer cells cannot grow in such a medium .

2) α-lactalbumin:

Human α-lactalbumin made lethal to tumor cells (HAMLET) is a protein–fatty acid complex that was originally discovered in human milk, consisting of α-LA and oleic acid .An α-lactalbumin-oleic acid (α-LA-OA) complex has exhibited selective antitumor activity in animal models and clinical trials we used a novel technique, isobaric tags for relative and absolute quantitation, to analyze the proteome of tumor cells treated with α-LA-OA. According to the differentially expressed proteins, α-LA-OA exerted its antitumor activity by disrupting cytoskeleton stability and cell motility, and by inhibiting DNA, lipid, and ATP synthesis, leading to cellular stress and activation of programmed cell death. This study provides a systematic evaluation of the antitumor activity of α-LAOA, identifying its interacting targets and establishing the theoretical basis of α-LA-OA.

3) Parthenolide:

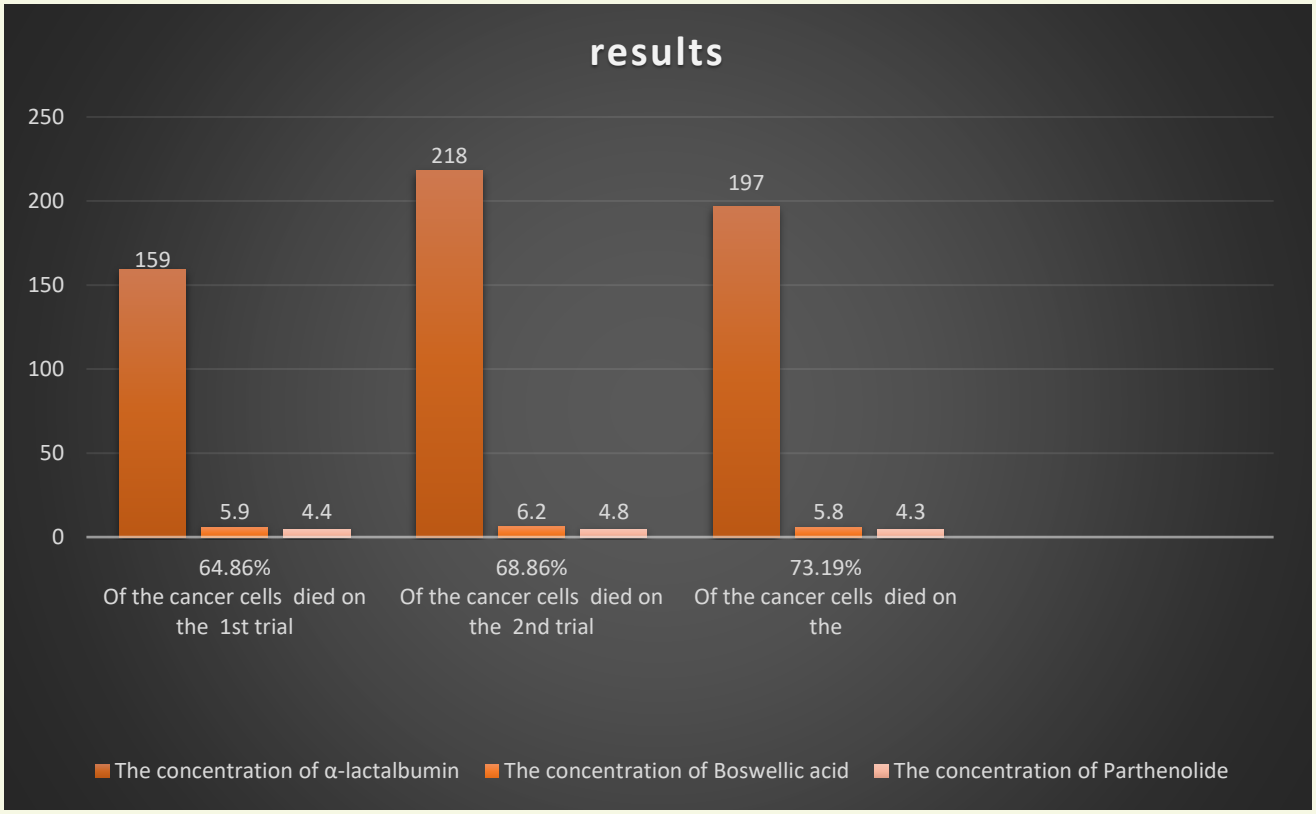
HER2-ECD (human epidermal growth factor receptor 2 – extracellular domain) is a prominent therapeutic target validated for treating HER2-positive breast and gastric cancer.

Parthenolide is the principal sesquiterpene lactone isolated from the herb feverfew (Tanacetum parthenium). It is a potent nuclear factor kappa B (NF-kB) inhibitor which inhibits a common step in its activation by preventing the degradation of IkB-k and IB-k. Specifically, it inhibits subunits k-IkB of the IkB kinase complex. NF-kB is important for the expression of multiple cytokine genes involved in the cellular inflammatory, immune responses and has been also implicated in the regulation of cell proliferation, transformation, and tumor development. It regulates genes important for tumor invasion, metastasis and chemoresistance .NF-kB migrates into the nucleus and activates the expression of numerous target genes that are important for the cell proliferation and regulation of apoptosis .It has been shown that NF-kB is constitutively active in some cancers .Besides the inhibition of DNA binding of transcription factors NF-kB and STATs, the antitumor activity of the parthenolide is believed to be due to the activation of Jun N-terminal kinase (JNK), reduction in mitogen-activated protein (MAP) kinase activity and generation of reactive oxygen species .The ability of parthenolide to alter the function of three transcription factors makes it an ideal antitumor agent that can sensitize cancer cells to chemotherapy by reducing the activity of antiapoptotic genes. Parthenolide reduced viability of all three cancer cell lines in a concentration-dependent manner. 5

Results:

Data were presented as the mean value and standard error of the mean (SEM). Statistical analysis was performed using the ANOVA with Tukey post-hoc test. Significance was accepted at $p < 0.05$. The IC50 value (the concentration of drug necessary to induce 50% inhibition), together with confidence limits, was calculated using computerized linear regression analysis of quantal log dose-probity functions, according to the method of Litchfield and Wilcoxon these results is still under test: -

The effect of clone cell line on each trial	The concentration of α-lactalbumin	The concentration of Boswellic acid	The concentration of Parthenolide
64.86% Of the cancer cells died on the 1st trial	**159 µM**	**5.9 µM**	**4.4 (3.4–5.6) µM**
68.84% Of the cancer cells died on the 2nd trial	**218 µM**	**6.2 µM**	**4.8 (3.4–5.6) µM**
73.15% Of the cancer cells died on the 3rd trial	**197 µM**	**5.8 µM**	**4.3(3.4–5.6) µM**



conclusion:

Our project is a good choice for treatment of cancer because of its availability and influence.

Our results prove that these materials target cancer cells only and have no effects on the other cells. When we mixed these materials with each other, nothing occurs.

They don't have any effect in mechanism on each other. By using specific concentration of each material, we reach these results and with any change in concentrations, these results will change by badly way. The important thing is to make sure that the patient does not relapse again.

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