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# Iraqi Researchers Contribution to the “Killer by Lottery”, Cancer: On the Way to Global Reputation

By  
Associated Professor:  
Nohad Al-Omari

Since the previous decade, we have noticed an increase in the cancer spread globally and on the local level as well, it is also known that this disease does not differentiate between poor and rich, educated or uneducated, and a child or an old person. Our continuous efforts to invent a real pharmaceutical product that can be effective selectively is still a dream to come true either by ourselves or hopefully by one of our students in our laboratories.

The issue of anti-cancer drug selectivity is quietly underestimated in the media that is always covering such topics. Thus, until discovering a natural or synthetic compound that can kill only the cancer cells, and is safe to normal cells at the same time, for merit ethical reasons we cannot label an anticancer drug as a “miracle” drug until fulfilling the selectivity character.

On the other hand, publications and patents in this field either by Iraqi scientists or about the Iraqi cancer patients are still not explored enough. For example, many of our pharmacy school students at Al-Kitab University in this issue have highlighted the efforts related to inventing anticancer drugs that were conducted on Iraqi patients such as leukaemia, breast cancer



Figure 1: A view to some of my team patents since 1996.

research in Al-Kadhmia teaching hospital, urinary bladder, colorectal, and lung cancer evaluation among Iraqi population, as well as the application of nanotechnology in treating cancer. It is worth mentioning that as a member

of different international and national research and academic committees, and through synthesising different anticancer compounds, my team and I were able to register a wide range of patents since more than twenty years

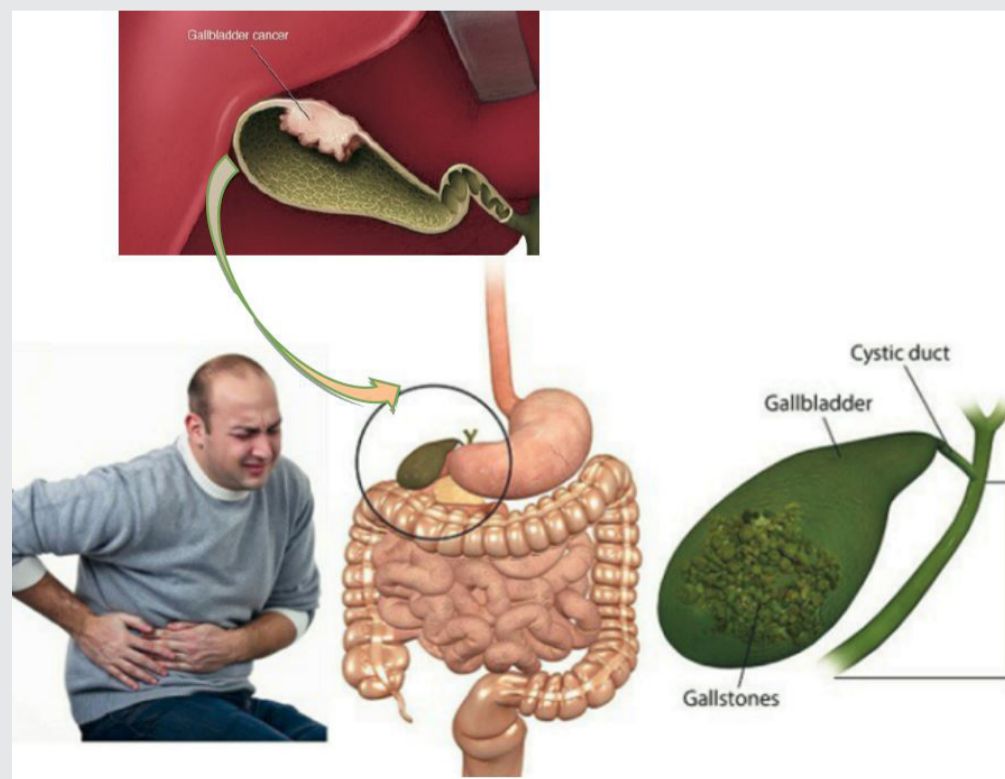
ago as seen in figure 1. Our aim was not to only produce such compounds, but to also make sure that they can be stable using different technologies such as the green chemistry.

## The Rare Cancer of Gallbladder Cancer

By: Samya Saman  
Mohammed (First year  
Pharmacy student)

The gallbladder is defined as a small vesicle linked to the liver and the small intestine through the bile ducts. The cancer of gallbladder cancer is rare, has a distinctive geographical distribution as it occurs most frequently in Central America and South America and is prevalent in addition to their geographical distribution, race has a role in determining the susceptibility. The disease can be cured by the removal of the bile duct if the disease is detected early. Early detection, however, is difficult and very rare.

Gallbladder cancer is more common in women than men; with about one in 10 cases diagnosed in women, it is also much common in older people, especially those over 70 years. It is often difficult to detect the incidence of gallbladder cancer, as it needs special tests for detection. Its symptoms is summarized by the feelings of



abdominal pain, feeling of constant bloating, nausea and vomiting, the feeling of continuous pain above the stomach, the sensation of a mass in the abdomen, unwarranted weight loss and

fever. The most effective and popular method of treatment is the surgical removal of the biliary follicle with part of the liver and lymph nodes around the tumour. Most patients die within the

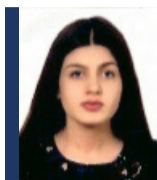
first year after surgery. If the surgery is impossible, open the obstruction of the bile duct, and the doctor may resort to chemotherapy or radiotherapy in addition to surgery.

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# Breast cancer and mastectomy: A statistical view globally and in the Arab region



**Avar Khalid Hassan (First year Pharmacy student)**

Breast cancer is the most common cancer also the major cause of cancer related deaths among Iraqi women. Because of the relatively late detection of breast cancer, the majority of the patients are still treated by modified radical mastectomy. A number of deaths from breast cancer is estimated at 100,000 women. Worldwide, Tonga ranks first or highest, with 21.91 deaths per 100,000 women in 2017, followed by Grenada, Barbados and no Arab country in the top ten. For the Arab countries, the highest Arab country is Syria as it is ranked 11th in the world, with 14.17 deaths, Lebanon with 12.19 deaths, Somalia with 12.18 deaths, Iraq with 11.70 deaths per 100,000 women. This means that Iraq is in the first quarter, and the 45th worldwide. The lowest Arab countries in the number of deaths from the disease are the United Arab Emirates, Qatar, 3.02, Oman, 3.45, Saudi Arabia, 4.03, Libya and 4.87 per 100,000 women. Figure 1 illustrates the causes and risk factors

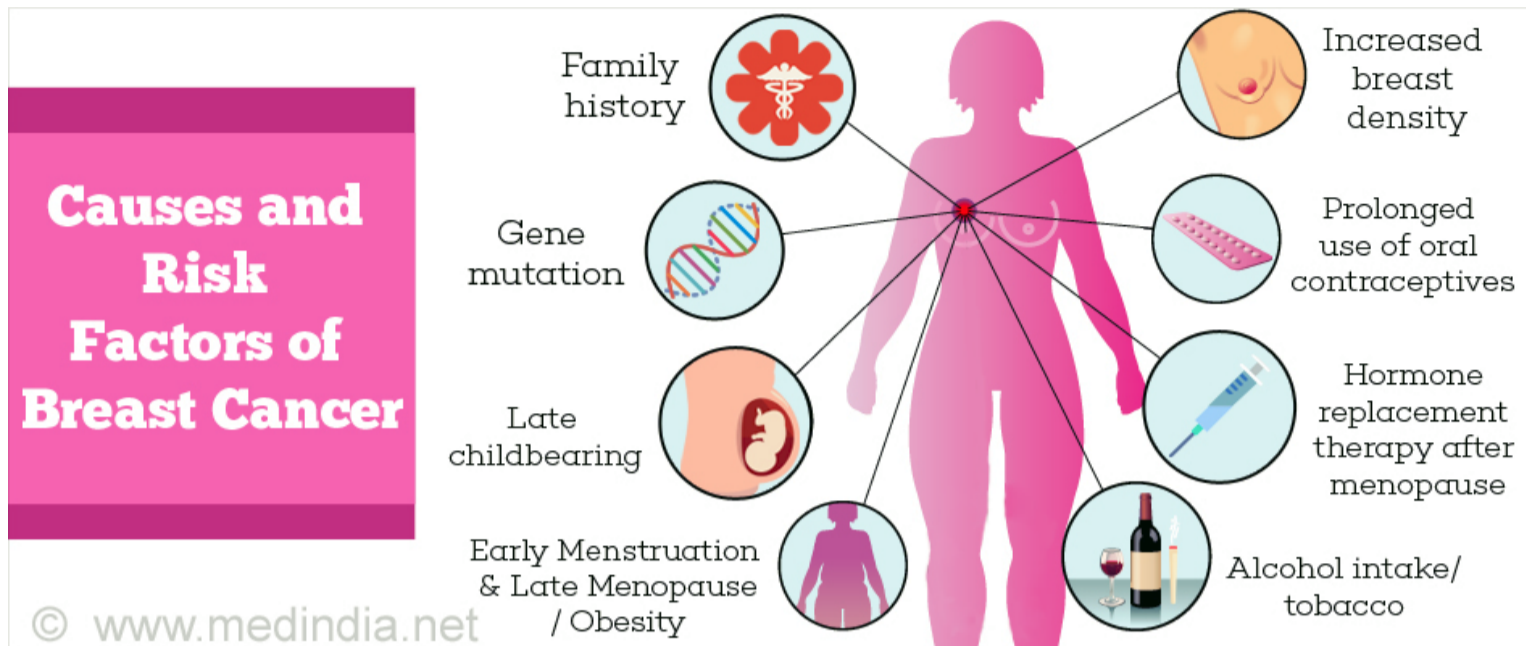


Figure (1): Causes and risk factors of breast cancer. Adapted from: <https://www.medindia.net/patientinfo/breastcancer.htm>

of breast cancer in women. It is well known by clinical research that the percentage of the patients who had surgical treatment during the first month following diagnosis seems rather satisfactory in reports from developing and some developed countries. Strengthening public education and adopting multimodality evidenced based management protocols are crucial steps to control the waiting times among those who

have delayed mastectomies.

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# Blood Cancer: leukaemia causes and treatment with glimpse on Iraq



**By: Anwar Ahmad and Elaf Wissam (First year Pharmacy student)**

Blood Cancer is known as leukemia and it is one of the types of cancer that starts in blood-forming tissue ,including bone marrow and lymphatic system. Leukemia usually involves the white blood cells, and result in high number of abnormal white blood cells (shown in figure 1). Leukemia does not know a specific age, however it is more common in children, yet other forms occur mostly in adults. The Major types of leukemia are Acute lymphocytic leukemia, Acute myelogenous leukemia, Chronic lymphocytic leukemia and Chronic myelogenous leukemia. The symptoms of this disease include fever or distancing, permanent fatigue ,weakness, frequent infections, loss of appetite or low weight, swollen lymph nodes enlarged liver or spleen, Easy bleeding or bruising, tiny red spots in

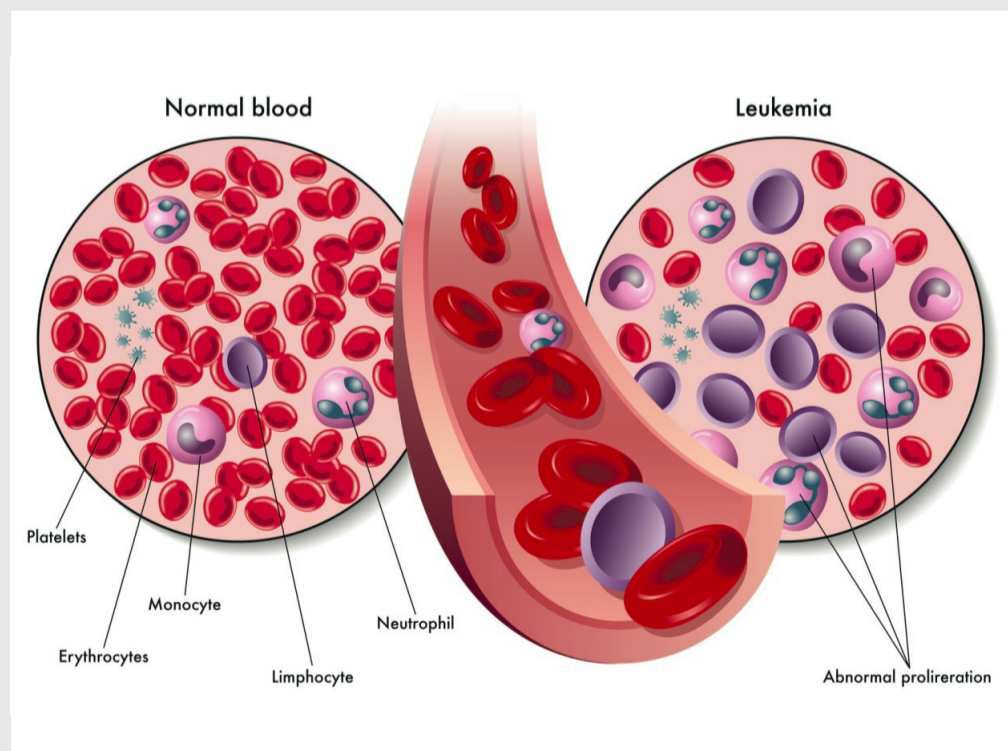


Figure (1): Difference between normal blood and leukaemia. Adapted from: <https://clicks.co.za/health/conditions/article-view/leukaemia>

skin, excessive sweating ,especially at night and bone pain or tenderness. Regarding cancer registry in Iraq it

shows that leukemia is the second leading cause of death among females and the third leading cause

of the death among male. Exposure to radiation for long periods and due to many reasons is known to lead to leukaemia in addition to the genetic factor. The treatment for leukaemia can be complex depending on the type of blood cancer and it usually involves one or more of chemotherapy, radiation, therapy, stem cell transplant, biologic or immune therapy, and targeted therapy.

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# The Nanotechnology In Treating Cancer

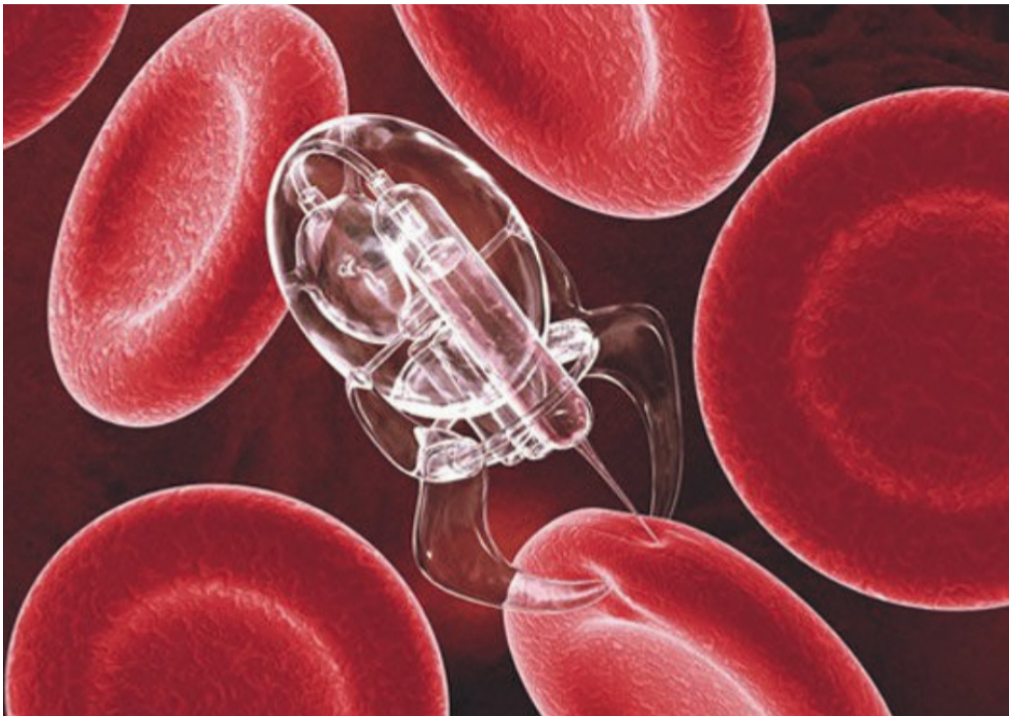


Figure (1): Injecting body with nanomaterials. adapted from: Scienceofsingularity.com

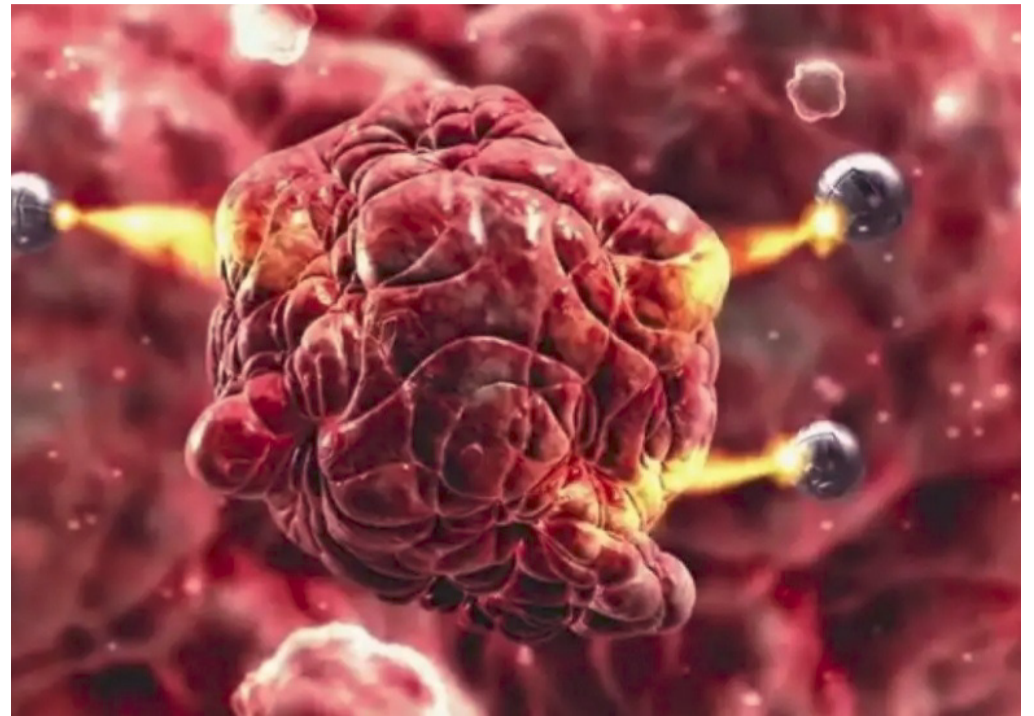


Figure (2): Nano-therapy using gold molecules. Adapted from Controlmakers.ir

By: Shahad Sarmad  
Faiq (first year  
Pharmacy student)

Nanotechnology is concerned with studying and processing matter on atomic, molecular and nanoscale. The new technique is based on injecting the body with light-emitting

nanomaterials, which emit short wavelengths of infrared light that travel through the bloodstream and bind to small cancer cells. It also involves Nobel metal nanoparticles such as gold nano particles. Gold items are prepared to nano chips, after purification of the gold material to nano it loses their non-interactive properties and transforms

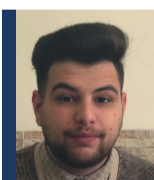
into an interactive and stimulating material, and then interacting with the cancer cell, while not interacting into sound cells and does not affect them. It was observed that gold therapy is better and safer than chemotherapy and radiation therapy as it does not cause complications for the patient unlike other cancer treatments. The nanotechnology application is still

not applied in Iraq, and definitely such new application will have significant impact in the treatment of most types of cancer.

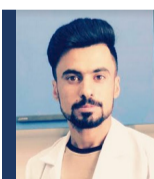
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# The myth of mobile phones and cancer: Different brands various radiation



By: Mohammed Yilmaz  
(first year Pharmacy  
student)

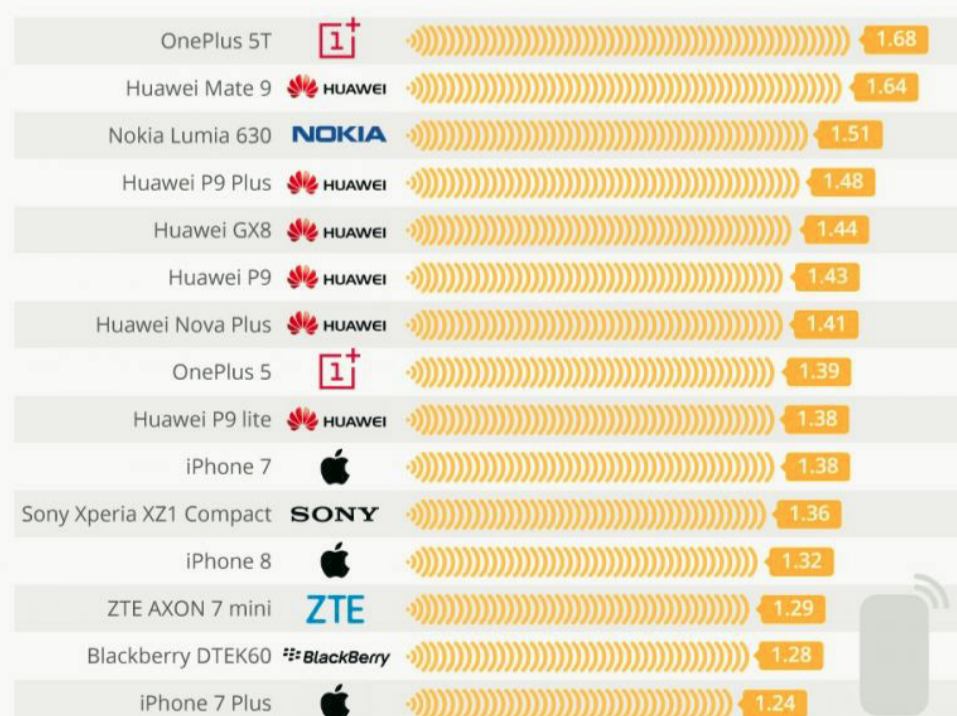


Muhanad Khalid Mijwil  
(first year Pharmacy  
student)

The number of mobile phone users in the world is expected to pass the 5 billion at the end of 2019. The cellular (cell) phone works by sending signals to and receiving them from the nearby cell towers using RF (Radio Frequency) waves. RF waves from cell phones comes from the antenna, part of hand-held phones. The body tissues closest to the phone absorb more energy than tissues farther away. The RF amount of energy absorbed from the mobile phone to the body of the user this known as the specific absorption rate (SAR). Different cell phones have different SAR levels. You can find this information on the manufacturer's website or in the user guide for the phone. The Bundesamt

## The Phones Emitting the Most Radiation

'Specific Absorption Rate' of smartphones that emit the most radiation\* (in watts per kilogram\*\*)



\* Current models (as of December 31, 2017) from the following vendors: Apple, BlackBerry, Google, HTC, Huawei, LG, Motorola, Nokia, OnePlus, Samsung, Sony, Xiaomi, ZTE

\*\* While calling with phone placed on ear  
Excluding 'Dual SIM' phones



Source: German Federal Office for Radiation Protection (Bundesamt für Strahlenschutz)



Figure (1): The radiation of various mobile models and brands (W/Kg). Adapted from: [www.statista.com/statistics/274774/forecast-of-mobile-phone-users-worldwide](http://www.statista.com/statistics/274774/forecast-of-mobile-phone-users-worldwide)

für Strahlenschutz (German federal office) for radiation protection, which tests devices for a nationwide certification for environmental safety called Blue Angel. They tested brand of phones that produce most radiation can put out 1.68 watts per kilogram (W/Kg). They also have been testing different brands of mobile from different regions and different manufacturer's. This is illustrated in figure (1). It showed that the famous American brand apple new iPhone x has a lower number 1.09 W/kg comparing to iPhone 7 model 1.38 w/kg. On the other hand, we did a hard work to find any official information or statistics that links cancer with mobile radiation in Iraq, thus it is highly recommended that healthcare and governmental organization work together to provide such information.

#### References:

1. American cancer association, accessed online on 25 March 2019 from: [www.cancer.org/cancer/cancercauses/radiation-exposure/cellular-Phones](http://www.cancer.org/cancer/cancercauses/radiation-exposure/cellular-Phones)



# Treating cancer outside the physiological approach: The psychological approach



By: Zhen Masud  
(first year Pharmacy student)

Despite the massive medical advancement in cancer treatment, the evidence from psychological research yet again establishes the fact that cancer affects a patient not only just physiologically but also psychosocially. This implicates the need for a holistic approach to cancer treatment, one that encompasses both medical and psychological interventions (MPIs). Scientists have well established the need for the psychological interventions in cancer treatment, especially in dealing with the various stresses that a cancer patient faces. Cancer patients are often stressed with the uncertainty, disease severity, physical difficulties, medical treatments, psychological state, and family issues. The various negative impact of stress in cancer patients involves the compounding to psychiatric comorbidity such as anxiety, depression, and posttraumatic stress disorder. Various psychosocial interventions in cancer care such as psychoeducation, rational emotive behavioral therapy, social support



Photo adapted from: <https://cbtpsychology.com/under-construction/>

therapy, cognitive behavioral therapy (CBT), and relaxation therapy are shown to have bring down the level of pain, insomnia, fatigue, loss of appetite, nausea, stress, anxiety, and depression; and improved physical functioning.

These interventions not only help patients cope during their treatment

phase and hospital stay but also help in the "re-entry" phase, i.e., when the patients get back to their normal life after their treatment.

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life in patients with cancer. *Indian J Palliat Care.* 2015;21:203–8.

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# Lung Cancer: Cellular level approach



By: Khoshawest Solaf  
Ali (first year Pharmacy student)

Lung cancer is a lung disease characterized by uncontrolled cell division of living cells and the ability of these dividing cells to invade and spread other tissues of the lung, either by direct growth toward a nearby tissue or by the passage and invasion of distant tissues in a process known as transduction. Most cancers that start in the lung and are known as primary lung cancer are derived from epithelial cell carcinoma and are also called oat cell cancer. The main cause is exposure to tobacco smoke, which is the leading cause of 90% of lung cancer cases.

Lung cancers are broadly classified into two types: small cell lung cancers (SCLC) and non-small cell lung cancers (NSCLC). This classification is based upon the



Figure (1): Lung cancer cell, adapted from: <https://www.targetedonc.com/publications/targetedtherapies-lung-cancer/2014/lungcancermay2014/evolving-survival-rates-in-non-small-celllung-cancer>

microscopic appearance of the tumor cells.

These two types of cancers grow, spread, and are treated in different ways, so making a distinction between these two types is important.

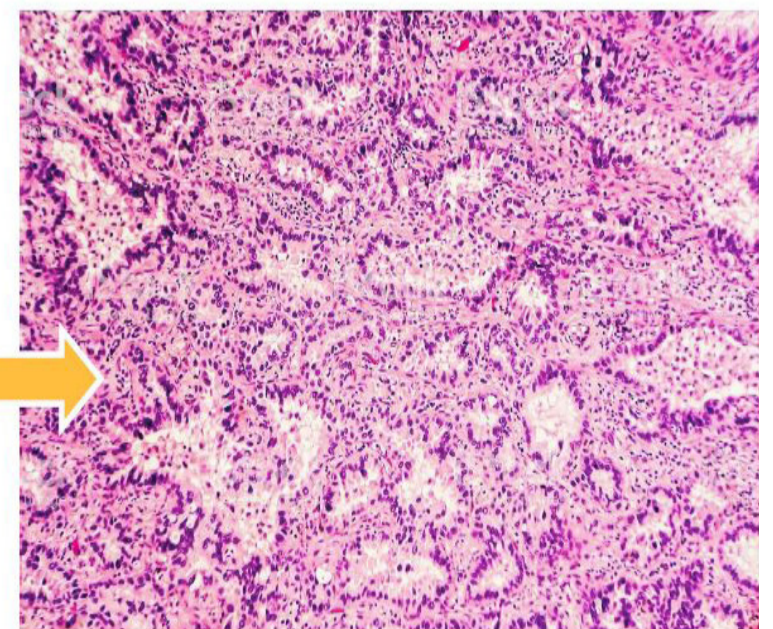


Figure (2): Lung cancer cells under microscope, adapted from: [istockphoto.com/photo/adenocarcinomagm531314236-93738667](https://istockphoto.com/photo/adenocarcinomagm531314236-93738667)

#### References:

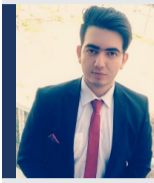
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«Epidemiology of lung cancer: ACCP evidence-based clinical practice guidelines (2nd edition)». *Chest.* American College of Chest, 2007.



# Novel treatment of cancer: The CAR T-Cell Immune Therapy



By: Marwan Isam  
(First year Pharmacy student)



Mzhr Asi  
(First year Pharmacy student)

CAR means (Chimeric antigen receptor) it is a kind of T-Cell therapy used to treat cancer by employing your own immune system, doctors take a type of white blood cells (WBC) from your own body and genetically change the cells in the lab. so the doctors may better find your cancer or which type of cancer you have. Millions of the CAR-T cells are grown in the lab. and then given to the patient by infusion. The T-Cells are taken from a patients blood then the gene for a special receptor that connects to a certain protein on the patients cancer that have and cells is added in the lab. and it kills them. Blood from a vein in the patient's arm flows through a tube to an apheresis machine, and then which removes the white blood cells,

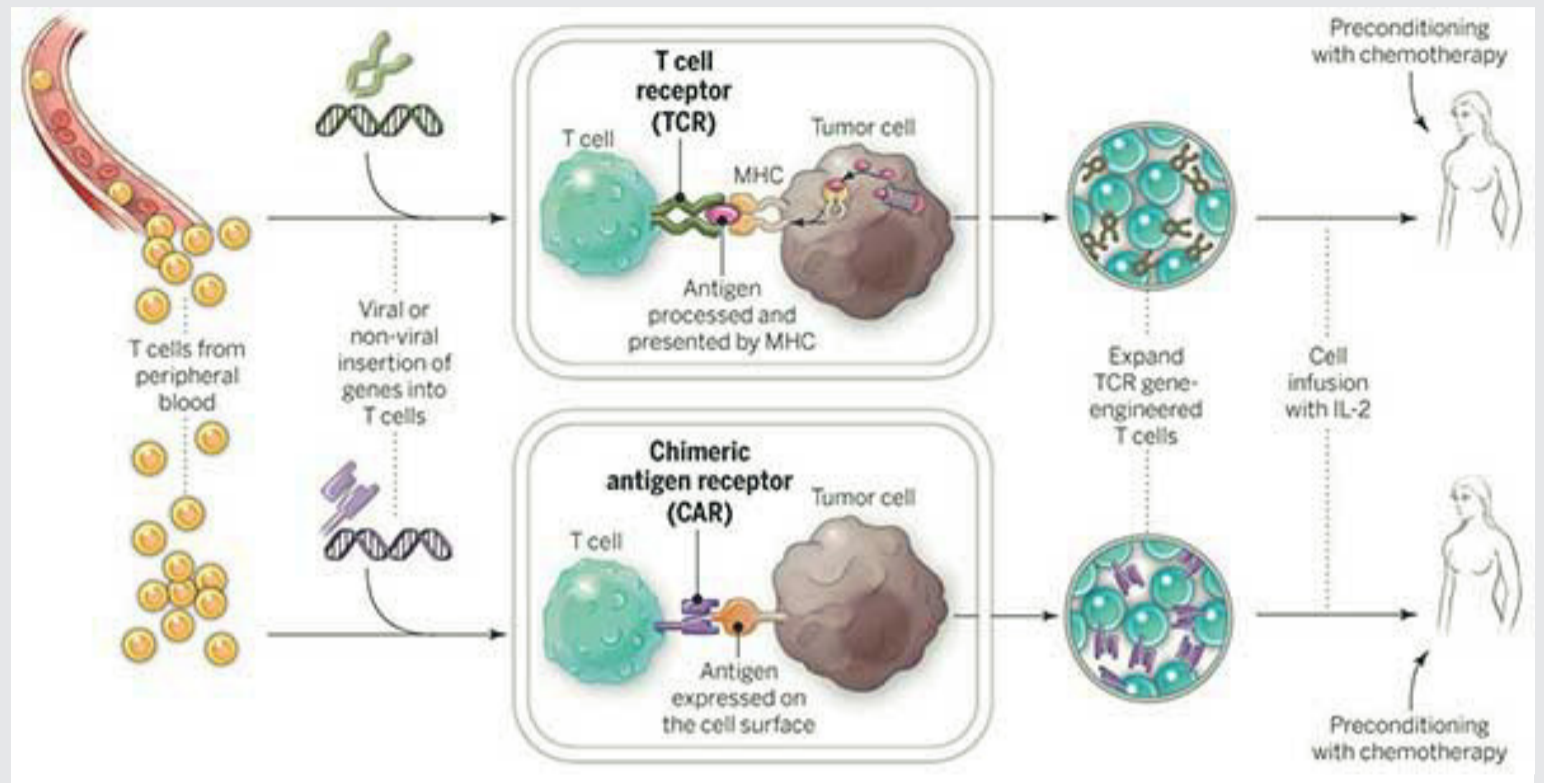


Figure (1): the process of CAR T cell cancer therapy, adapted from: <https://www.cancergov/aboutcancer/treatment/research/car-t-cells>

including the T cells, and sends the rest of the blood back to the patient as illustrated in figure (1). Interestingly, chemotherapy (chemo) and stem cell transplants are the first choices for treating these diseases,

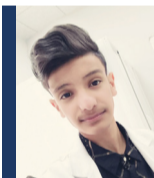
but if they do not work after at least two tries, or cancer comes back after treatment, CAR- T cells may be an option for some people, Unfortunately, CAR T-cell therapy is an expensive approach that can cost with the stay

of the hospital a total of \$1.5 million.

#### References:

1. National Cancer Institute, accessed online on 28 March 2019 from: <https://www.cancer.gov/search/results>

# A brief introduction to bladder cancer



By: Mohanad Badry Zayan  
(First year Pharmacy student)

Cancer of the urinary bladder is the ninth most common cancer worldwide and the thirteenth most common cause of cancer death. Most bladder cancers originate from the urothelium that covers the inner surface of the bladder. A total of 1216 cases of urinary bladder cancer in Iraq were evaluated for histological type and association with schistosomiasis. The detection rate of schistosomal ova was only about 30%. About half of the cases were squamous cell carcinomas and there was a high frequency of schistosomiasis. The most significant risk factor is smoking which increases the risk up to 4 times.

Smokers were reported to have more aggressive forms of the disease and it is progression. Carcinogenic substances used in industry also show a possible causal link to the onset of bladder cancer. Age is a risk factor as tumors rarely occur in people before 40.

Bladder cancer is often diagnosed at later stages. Based on your disease stage and predicted outcomes, recommended treatment may include a. Surgery, b. Chemotherapy, c.

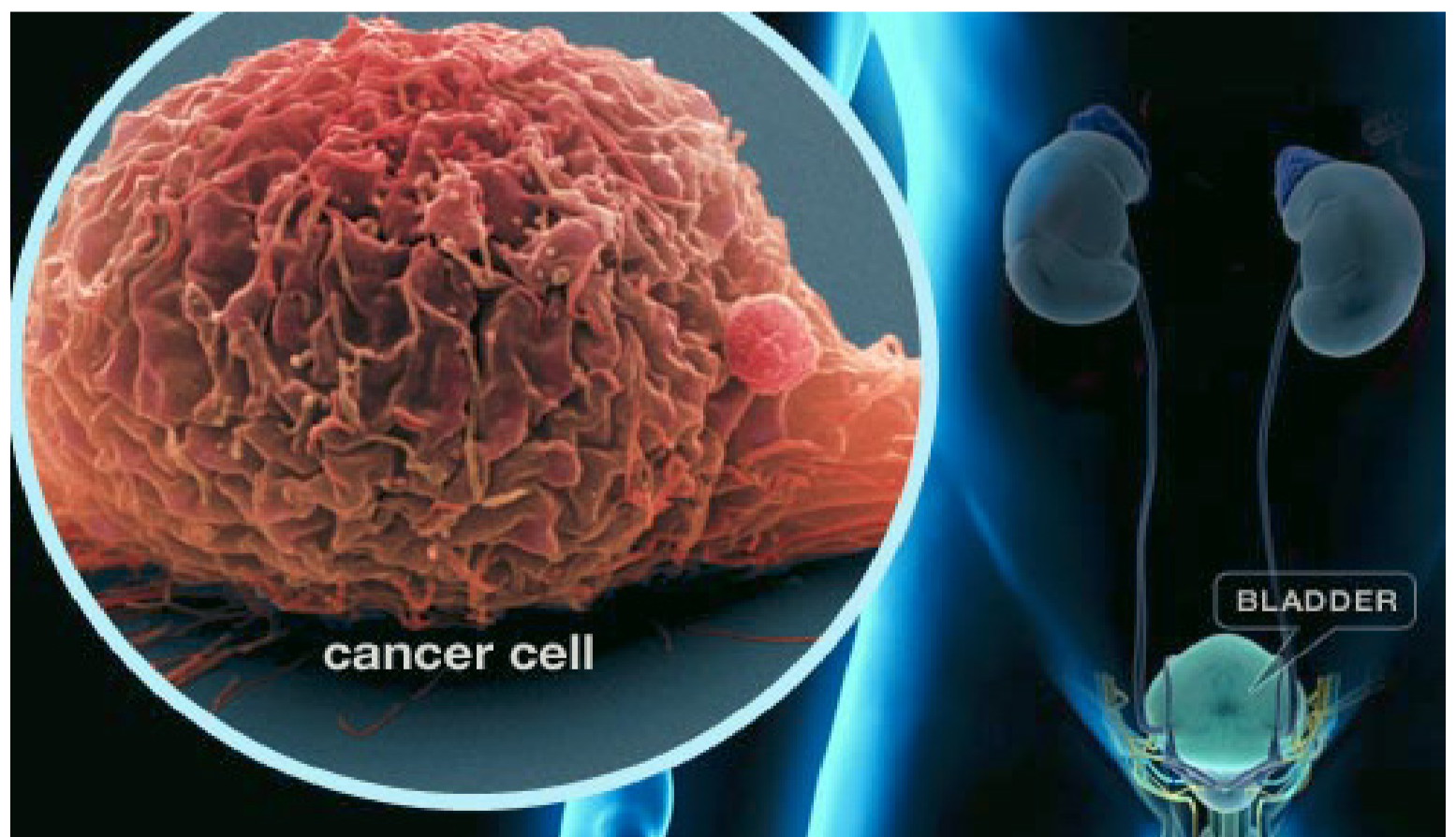


Figure (1): Structure of bladder cancer cell, adapted from: <https://www.webmd.com/cancer/bladdercancer/default.htm>

Palliative care. Recommended treatment and predicted outcomes will be based on your cancer stage. The planned treatment approach should be discussed by a multidisciplinary tumour board. This board is made up of practitioners from different medical specialties. They share their

different professional opinions to plan appropriate care for individual cancer patients.

#### References:

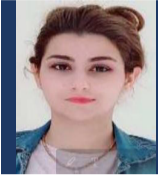
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2. Australian Cancer Council, accessed online on 12 March 2019 from: <https://www.cancer.org.au/aboutcancer/types-of-cancer/bladder-cancer.html>



# The antiperspirant use and breast cancer: Iraqi approach



By: Zyna Al Ali  
(Second year pharmacy student)

Suggestions of strong link and denial of that link between antiperspirant use and breast cancer development have been part of great argument in the scientific and social communities. In general figure (1) shows the most toxic excipients in antiperspirant products. Accordingly, a group of Iraqi scientists studied the possible association between the use of antiperspirants and some other factors with the development of breast cancer in Al-Kadhmia teaching hospital – Iraq. The idea is that the applied antiperspirants on the body do not disappear spontaneously, instead the body deposits them in the lymph nodes below the arms.

These lymph nodes are located in the upper outside quadrant of breast area where almost all breast cancer tumors occur. A total of 54 women with breast cancer where involved in this case study, the control group where of 50 women that were cancer free, the scientists interviewed all the women through a purposely designed questionnaire. As a conclusion, 82% of the control samples used antiperspirants compared with 51,8% of cancer cases, accordingly, the use of antiperspirant had no association with risk of breast cancer, while family history and oral contraceptives use were found to be associated.

References:

1. Iraqi cancer board. Results of Iraqi cancer registry 1995-1997-. Baghdad, Iraqi ministry of health, 1997.



Figure (1): most toxic excipients in antiperspirant products, adapted from: <https://blogdrjaney.com/201611/03//antiperspirants-and-the-cancer-risk/>

# Colorectal Cancer: What do you need to know to protect your body



By: Noor Mudhaffar  
(Second year pharmacy student)

It is well known that Iraq is a developing country with a very low incidence of cancer of bowel diverticular disease and ulcerative colitis in comparison to the western countries. The prevalent colorectal diseases at that time were those related to high fibre diet e.g. appendicitis and volvulus, while the stages of colon cancer is illustrated in figure (1). Colon cancer is a neoplastic disease of the large intestine, which can be derived from both inherited and somatic genetic alterations that develop over the course of a lifetime. On the other hand, and according to the Iraqi colorectal cancer registry, it's considered as the 7th among the commonest 10 cancers by site. Records of patients diagnosed with colorectal cancer in different regions of the country records between 1965 - 1994 and between 2013 - 2016 as well as between 2014 - 2015 were studied by a team of scientist in the university of Baghdad teaching hospital that conducted the research under the theme of 30 years experience with colorectal cancer with a total patients numbers of 695. The highest incidence of the cancer was seen at the median age of 50,

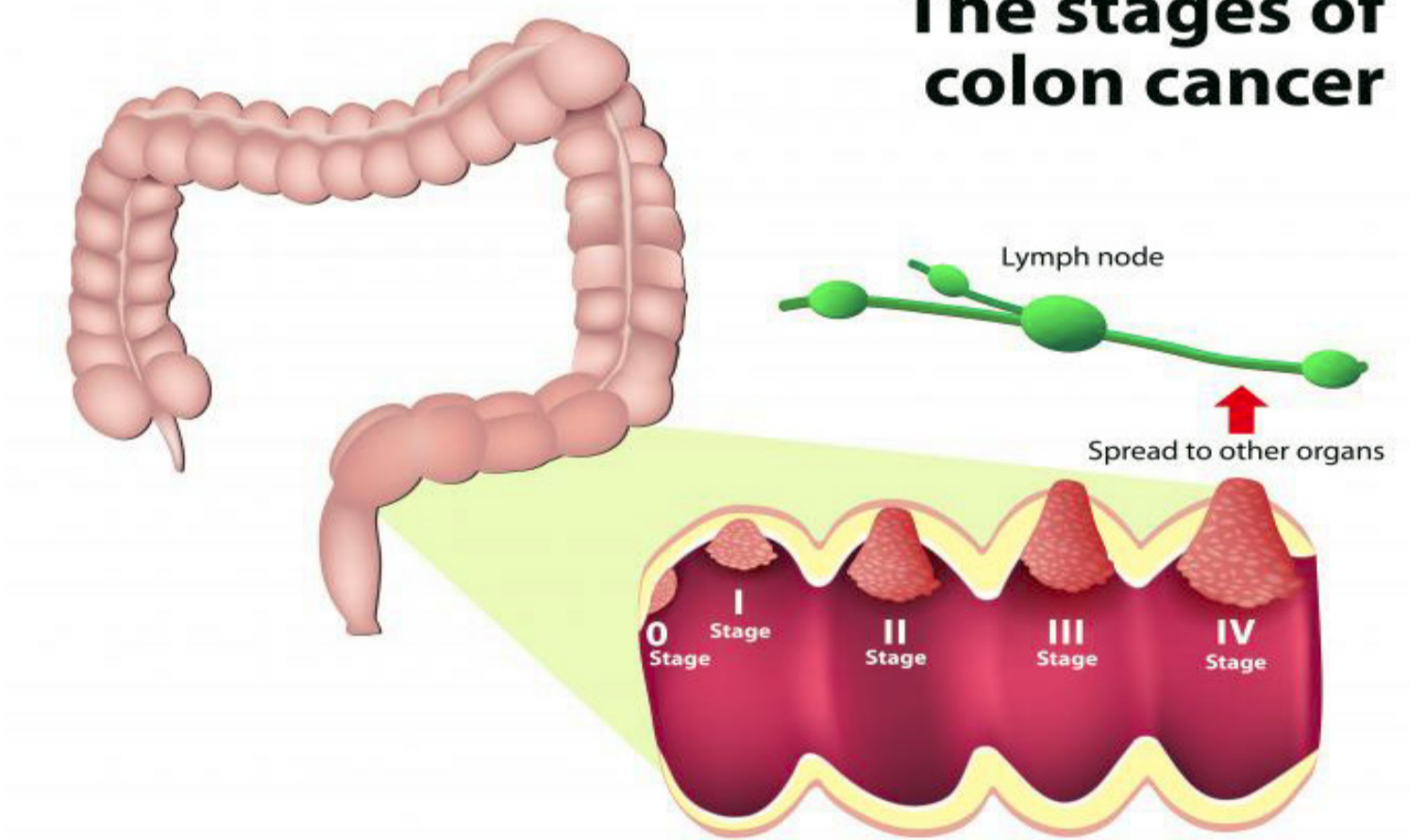


Figure (1): The stages of colon cancer. Adapted from: <https://www.medicalnewstoday.com/articles/155598.php>

while the gender residency of patients have no effect on cancer percent. It was noticed that Iraq shares the epidemiology characters of developing countries in the Middle East, however, the shift towards the western-style of living in Iraq has probably led to the

increase of colorectal cancer among Iraq population.

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Ahmed Ameen, Basima Kadhim Abbood Aliedani, Husam Jihad Imran Aldubaisi, Ahmed Salih Hussien Alshewered. Colorectal cancer epidemiology and clinical study in Misan. Journal of Coloproctology, 2019.

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