

**Water Pollution  
and  
Cancer**



*By*

**Prof. Dr. Adel Denewer**

**Prof. of surgical oncology  
and**

**head of surgical oncology department**



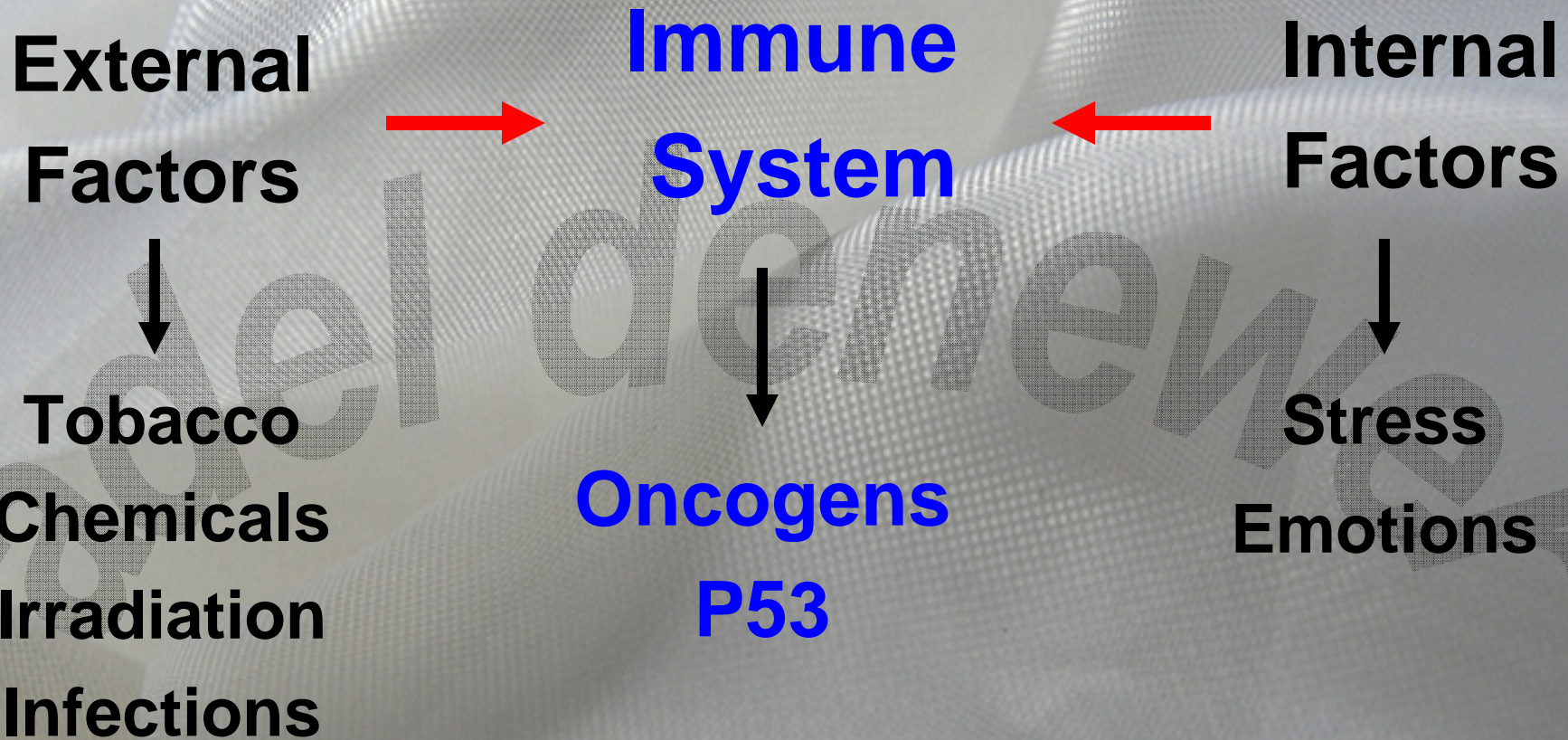
# What is cancer??

**Cancer** is a group of diseases which are characterized by growth and spread of abnormal cells out of control of the internal milieu of the body

**If** this process is not controlled it will lead to death



# What is the cause of cancer ?





# What is the incidence of cancer?

About **1,399,790** are diagnosed in 2006 all over the world and this doesn't include non-invasive carcinoma



# What about cancer in Egypt?

## \*\* Incidence

**Male:** prostate- lung- U.B- liver-colon

**Female:** breast – cervix and uterus – colon-ovary

## \*\* Cancer death

**Male:-** lung- liver-colon – U.B- pancreas

**Female:-** - breast-lung- colon- pancreas





# Water pollution with carcinogens



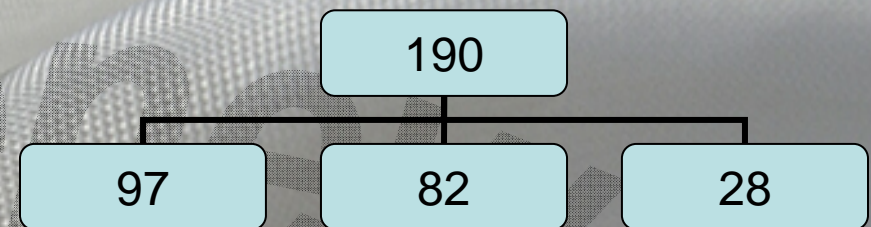
over **2100** contaminants have been detected in U. S. drinking water since 1974 with 190 known or suspected to cause adverse health effects at certain concentration levels.

\*\* **97** carcinogens and suspected carcinogens,

\*\* **82** mutagens and suspected mutagens,

\*\* **28** acute and chronic toxic contaminants and

\*\* **23** tumor promoters have been detected in U. S. drinking water since 1974. The remaining 90% of the organic matter present in drinking water has not been identified by testing to-date.







**Water pollution  
and  
cancer**



# Nitrates

- \*\* Contamination of drinking water with nitrates is a growing problem in many agricultural areas of the country.
- \*\* A Branch study in Nebraska noted an association between measured nitrate levels in community-supplies drinking water and an increased risk of non-Hodgkin's lymphoma.



**\*\* Further studies in Iowa are evaluating community-supplied drinking water nitrate levels and cancers of the bladder, brain, colon, rectum, pancreas, and kidney.**

**\*\* The population using private wells can have considerably higher exposure to nitrate because private wells are not regulated and they are often located in agricultural areas.**



# Chlorine

- \*\* Chlorine interacts with organic materials in water to form a mixture of chlorinated chemical by-products. Although concentrations are quite low, there is concern that some chemicals in the mixture may increase cancer risk.
- \*\* A Branch study of six cancer sites conducted in Iowa found associations of rectal and bladder cancers with long-term (> 40 years) exposure to drinking water high in these byproducts.



**\*\* In the chlorination process itself, chlorine combines with natural organic matter decaying vegetation to form potent cancer causing trihalomethanes (THM's) or haloforms.**

**\*\* Trihalomethanes collectively include such carcinogens as chloroforms, bromoforms carbon tetrachloride, bischloroethane and others. The amount of THM's in our drinking water is theoretically regulated by the EPA (**environmental protection agency**).**

**\*\* Although the maximum amount allowed by law is 100 ppb, a 1976 study showed 31 of 112 municipal water systems exceeded this limit.**



# Arsenic

**\*\* A variety of human cancers are associated with arsenic ingestion**

Lung, bladder, prostate, skin, liver... –

Arsenic inhibits chromosomal repair, enhances –  
cancer progression

**\*\* Circulatory and neurological damage, diabetes also can occur**

Arsenic inhibits mitochondrial respiration –

**\*\* High disease levels seen in populations drinking water with arsenic 5-20 times higher**







**Finally**

***If your drinking water is polluted  
, don't drink it You can  
purchase very effective filters  
which will remove 99% of the  
toxins or purchase proper  
bottled spring water.***

***Just this simple safeguard may  
save thousands from cancer***





Thank you