

The Merciless Killer



Image 1, Grim Reaper
<http://images.art.com/images/PRODUCTS/large/10104000/10104551.jpg>



Image 2, Pregnant Woman
<http://www.usda.gov/oc/photo/b02c2059.jpg>

What are mutagens?

There is a silent killer out there, it often strikes undetected and its effects are irreversible. Your developing child is highly susceptible to this silent killer, called a mutagen. It is important you learn about mutagens so you can protect your child from them. Mutagens are substances that cause changes in DNA or genes. Chemicals or physical agents may act as mutagens. These are harmful to your developing baby because they result in changes in your baby's DNA, which causes the baby to make defective proteins.

Mutagens in Food

Avoiding certain foods can help in your quest to keep your developing baby safe from mutagens. The most abundant source of mutagens in foods comes from cooking

muscle meats such as steaks or chicken breasts. The foods proven to be highest in mutagens are high fat meats cooked over charcoal or gas. When the fat drips off of the meat it burns on the charcoal, the emitted smoke is then reabsorbed by the meat above it. The smoke contains the mutagens. Studies have proven that when such foods are cooked in a manner that doesn't allow the smoke to be reabsorbed by the meat, the amount of mutagens is significantly decreased and at times eliminated completely.



Image 3, Steak
<http://www.wattersphotography.com/Gregg%20Watters%20Website%20/Watters%20Photography/1.Navigation%20Pages/Food%20and%20beverage/Steak%20on%20grill.gif>



Image 4, Wine
<http://events.tfn.com/bs2005/images/wine-bottle-grapes.jpg>

Almost everyone knows that alcohol is a mutagen. Alcohol is very damaging to the brain of a developing fetus where it can cause birth defects such as Down syndrome and mental retardation.

Tobacco is another common mutagen affecting more and more developing children today. When pregnant it is highly advised that you quit smoking or dipping tobacco in order to increase your child's chances at living a normal life.

Water Borne Mutagens

It is never a good idea to drink untreated water, especially around industrially active areas. Common water borne mutagens are arsenic, asbestos, benzene and vinyl

chloride. Often some amount of chemicals will leak from industrial plants into surrounding water reservoirs, polluting the water with mutagens.

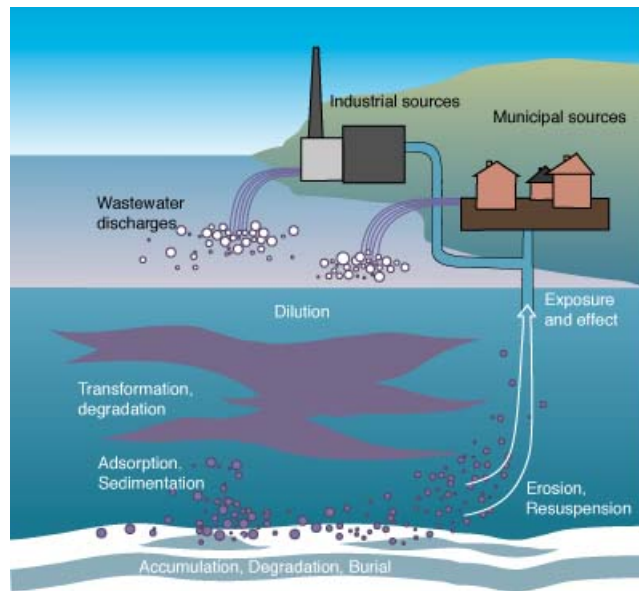


Image 5, Water-Borne Mutagens
<http://www.envimed.com/pics/emb06-01.jpg>

Many types of fertilizer have mutagenic effects. Fertilizers get into water supplies by means of water runoff from local farms after rain. The contaminated water makes its way into either rivers or under ground reservoirs and from there the mutagens travel to drinking faucets.

Radioactivity as a Mutagen

Radioactivity was the first known mutagen, recognized in 1920 for its mutagenic effects. Energy waves such as UV radiation cause significant mutations. It is important that you avoid long term, constant exposure to the sun, as this is the type of exposure to UV radiation that will cause the most mutations. Due to the low average dose over a long period of time, continuous doses of low levels of radiation will cause little or no mutations. On the contrary, a brief, high level of exposure to UV radiation for a very

short period of time is highly likely to cause a mutation. Therefore a day at the beach could prove to be much more dangerous than taking a short walk every day.

When pregnant there are some sources of radiation that are unavoidable. Organic substances such as wood or soil give off radioactive particles as they decompose. Since organic substances are generally unavoidable and the amount of radiation is inconsequential, the risk of mutation from these sources is minimal.

Sources of radiation

Despite Hollywood's depiction of radiation exposure as a single traumatic event, it is a fact that we are at constant risk of over exposure to radiation in our normal daily routines. It does not take a freak nuclear meltdown, a chemical spill or alien bombardment with radiation for mutations to occur. Simply spending a week at the beach will cause potentially dangerous levels of radiation if proper precautions such as wearing sun block with a high sun protection factor (SPF) are not taken. As mentioned earlier, any dead organic matter is in a constant state of decay and therefore is emitting a steady stream of radiation into the surrounding area as time progresses.

With the technological boom which began in the early nineteen hundreds, our exposure to mutagens has significantly increased. Medical X-Rays are one of many human-made sources of radiation that may cause mutations, along with microwaves, especially those without shields, and power plants. AM, FM and TV radio waves are a mixed blessing, while they carry information at great speeds, they are also a danger to us all as harmful, man-made mutagens that could effect pregnant women. Sadly, these

mutagens are simply a fact of life and you have no way of controlling your exposure to them.

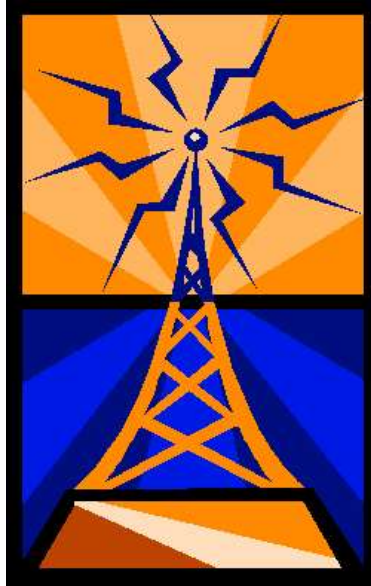


Image 6, Radio Tower
http://www.gosupernet.com/assets/images/radio_tower.jpg

The Effects of Mutagens

Due to differing levels of potency, exposure for the same amount of time to some mutagens is more dangerous than exposure to others. There is a relative scale called rems (roentgen equivalent man) that accounts for differing levels of potency and puts all types of radiation into a more comprehensive perspective. As suggested by the name of the measurement, rem only applies to humans; the scale is different for each species. The average dose of rems in one year for humans is about 330 millirems.

A *sublethal* (one time) dose is somewhere between 100 and 250 rems and will cause some nausea and possible vomiting. Male sterility is common, effects generally last 1-4 weeks.

A *lethal* (one time) dose is between 350 and 450 rems, effects are more intense and set in early; vomiting and nausea are certain and death is 50% certain as a result of gastrointestinal failure or a plunge in white blood cell count.

Finally, the worst level of exposure is a *superlethal* one time dose, one that is greater than 650 rems. Symptoms are severe and again include vomiting and nausea, but also now include the risk of shock, diarrhea, abdominal pain and fever. Death may onset in as little as an hour to a day or two. Survival is rare and death will be a slow and agonizing process.

Mutagens will cause different defects in developing fetuses and some of them prove to be very interesting. One effect is a third nipple; a condition found quite commonly, around 1 in every 1000 males has it. A rare condition call Cyclops is at times found; people who have it are actually born with a third nonfunctional eye in their forehead. Most parents choose to have corrective surgery on their child to have the “eye” removed and to give the child a shot at a normal lifestyle.

More life altering effects of mutagens are mental retardation and disfigurement. Some of the worst results of mutagens are not repairable and will cause lifelong difficulties for the families of the affected child and the child him/herself. Mutagens are also a factor to be considered early in the investigation of miscarriages, since they have the potential of rendering a developing baby unable to manufacture one of many proteins vital to human existence.

What does it all mean?

Although not entirely unavoidable, the knowledge of mutagens and their sources is a powerful weapon in the hands of a potential mother. With the knowledge of what to avoid, what symptoms to look for and how mutagens work, precautions may be taken that will save an unborn child's life and give one more human his/her right to a life on Earth.

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