

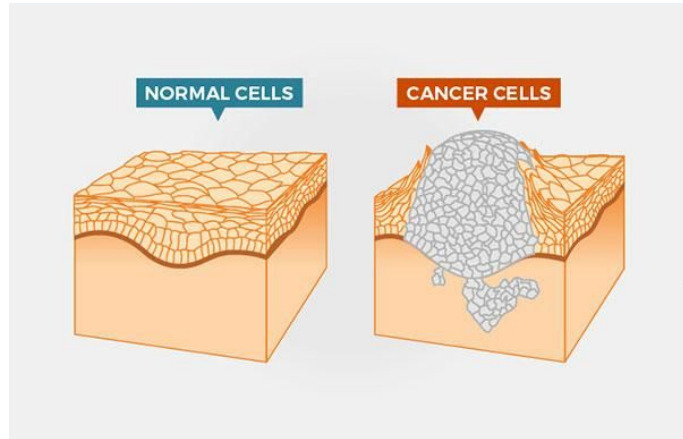
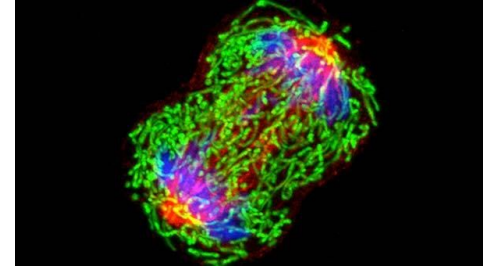
Cancer & Electromagnetic waves



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Cancer

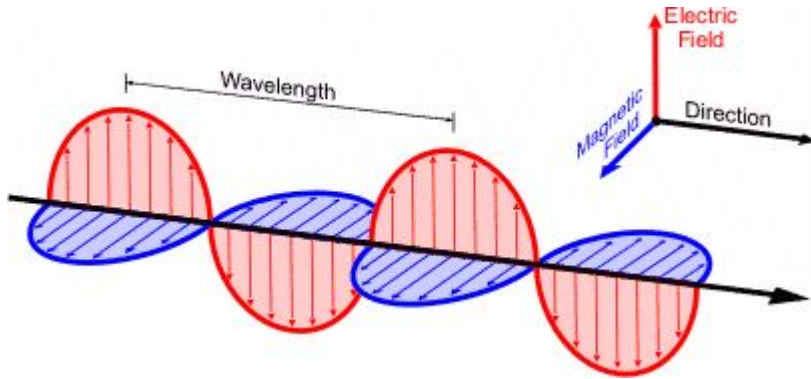
Collection of related diseases. It concerns **genetics diseases** due to changes to genes that control **the way our cells function**, how they grow and divide.



It can rise by **inheritance** or due to DNA damages caused by **noctives environmental exposures** (tobacco smoke, radiations, ultraviolet rays...).

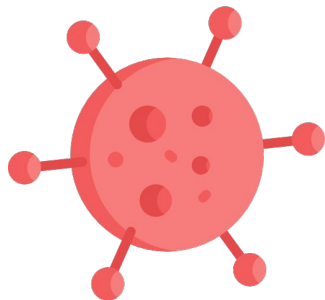
Cancer cells tend to divide and grow uncontrollably and spread into surrounding tissues. These abnormal growths are called **tumors**, which are masses of tissues.

EM waves



- EM waves are formed when **electric field** comes in contact with **magnetic field**. Both fields are perpendicular
- EM waves travel through anything (vacuum, air, solid material), it does not need a medium to propagate
- “**Transverse**” waves → measured by *amplitude* and *wavelength*
- Examples of EM :
 - microwaves
 - X-rays
 - gamma rays

Supposed effects



Cancer



Headache



Nocebo effect

Studies

Humans

The INTERPHONE Study

Focus on 4 types of tumours : glioma, meningioma, parotid gland and acoustic nerve.

Led in 13 countries

Not relevant studies, based on self reports such as interviews and questionnaires

Animals

Experiences : Exposure of male and female rats to RF

- for 19 hours everyday from gestation until death.
- for 9 hours everyday for 2 years.

Results : increased occurrence of heart schwannomas in male rats, but not in female rats (only with the highest RF dose)

Recognized effects

- Heat, absorbed mainly by epidermis
- Globally no data that lead to a proof of existence of effect.
- Results may come from the bias of study or aberrant values
- Classified as “possibly carcinogenic” by IARC in 2011

**International Agency
Research on Cancer**



**World Health
Organization**

Synthesis of ANSES report

- Report on eventual effect of high SAR of mobile phones (2019) based on 57 research articles
- Tests mainly realized on animal (rats and mice) at different stages of development & with diverse conditions
- Risks are related to the power of exposure ($> 2 \text{ W/kg}$)
- Expertise reveal, with limited proof element, bad effect on sleep, male fertility, neuroma and glioma (cancers) and some other consequences
- For children, bad effect on cognitive functions (maybe due to effect of mobile phone itself, not only EM waves)
- Improvement of cognitive function for Alzheimer's patients (with limited proof)

One key advice : avoid too much exposure

Tips to reduce risks



Avoid long
conversations



Moderated young
& child's utilisation



Phone call with
earplugs



Avoid calls from
underexposed
areas



Avoid calls while
moving at high
speed



SAR (DAS in french)
of devices $< 2 \text{ W/Kg}$

Conclusion

- **High presumptions** of nocive effects due to electromagnetic waves exposure
- **Controversed results** appears in studies and reports
- Averated risks for **high** and **long time** exposure
- Simple **tips** to reduce risks



Sources

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