

DNA breaks and electric cardioversion (ECV)

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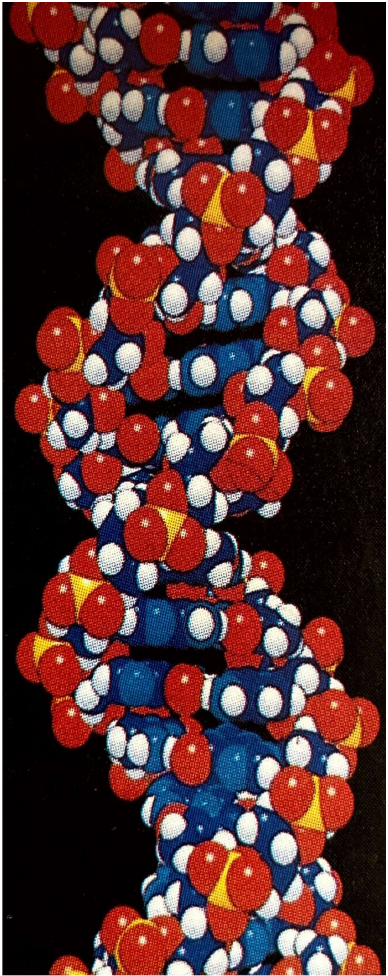
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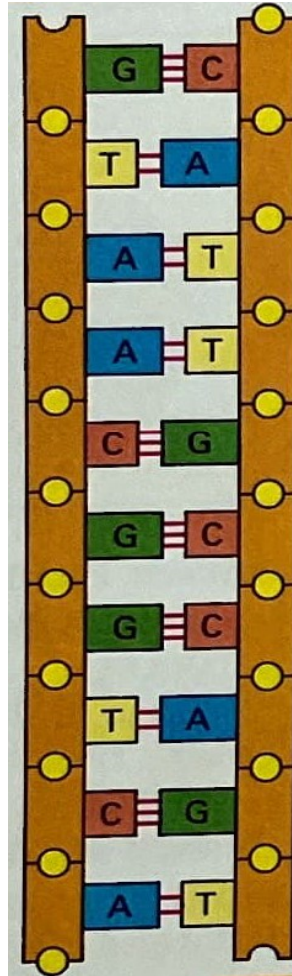
DNA structure



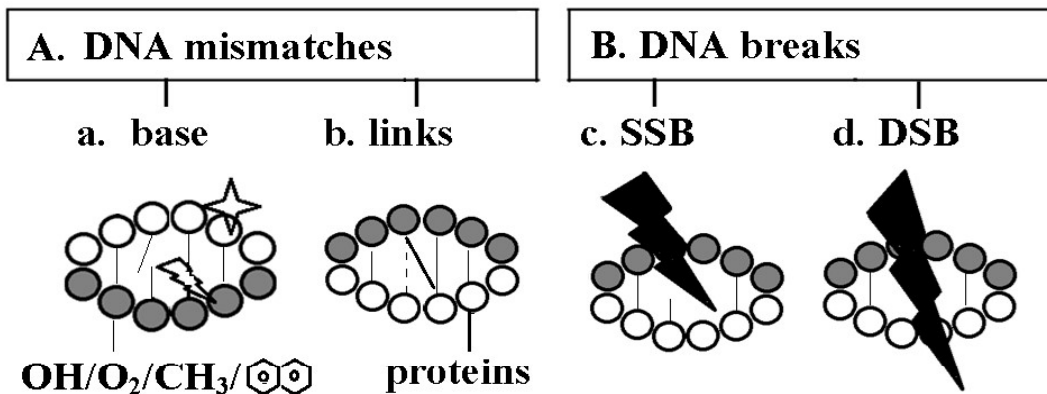
Two complementary chains/strands of nucleotides bonded together via hydrogen bonds

Nucleotides consists of five-carbon sugar attached with phosphate group and nitrogen-containig base

Nucleotides: *adenine (A)*, *cytosine (C)*, *guanine (G)*, *thymine (T)*.

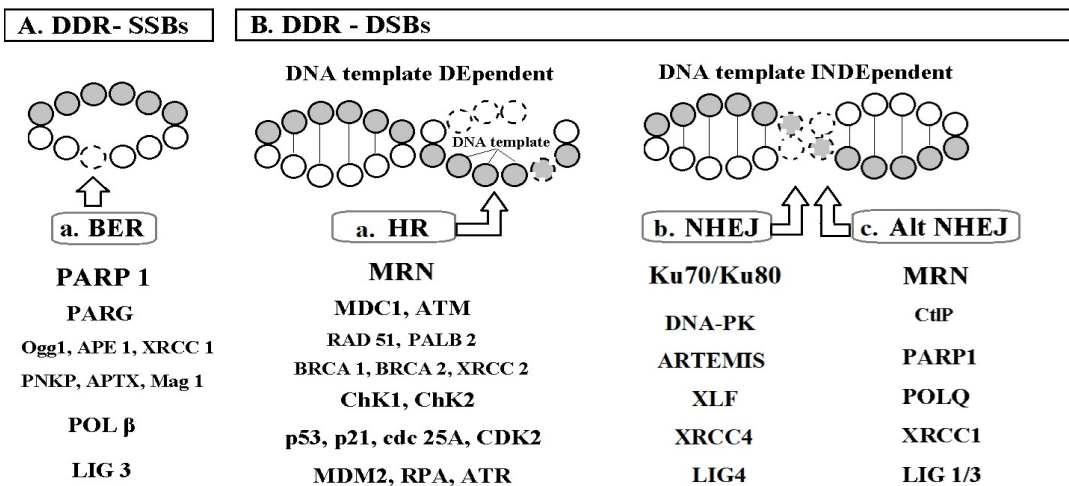


DNA damage



Biological, chemical, physical agents

Complex DNA damage detection and repair mechanisms



Ability to repair DNA damage is crucial to cell survival.

Severe DNA damage leads to programmed cell death.

DNA damage and ECV

Can short general anaesthesia and ECV induce DNA breaks?

Incl.: Patients undergoing ECV for atrial fibrillation/flutter, without structural heart disease or heart failure.

Excl: Active malignancy or cancer treated in last 1 year.

Exposure to radiation in last 1 week before ECV (X-ray, CT).

Surgery under general anaesthesia less than 1 week before ECV.

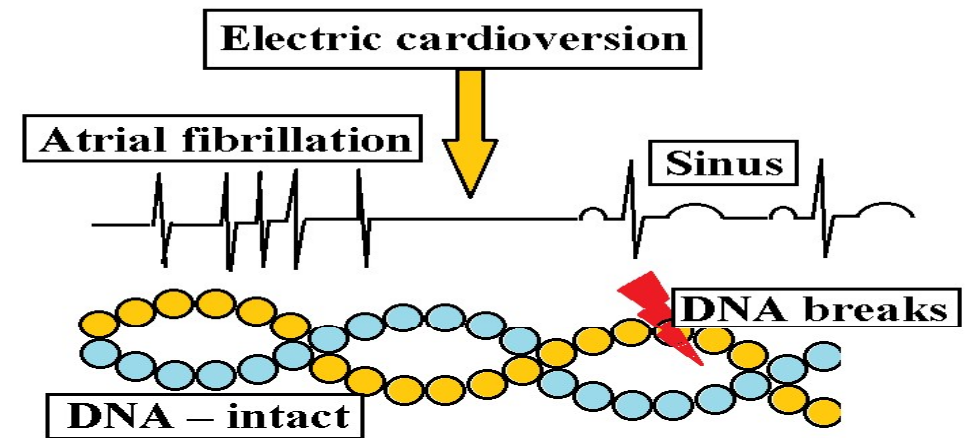
Symptomatic heart failure / cardiogenic shock.

DNA damage and ECV

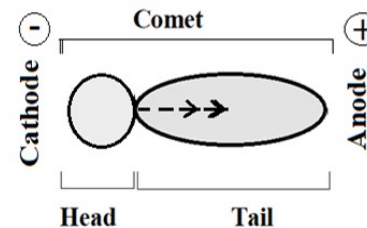
Prospective controlled study including 15-25 pts. and 5-10 healthy controls.

3 blood samples (pre-ECV, 30 and 60 min post-ECV)

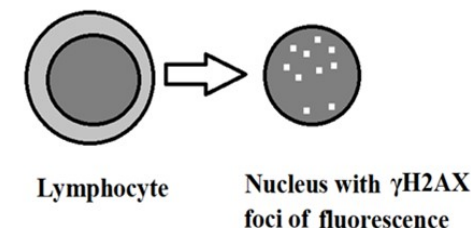
DNA breaks analysed by Comet assay and γ H2AX in peripheral blood lymphocytes.



A. Comet assay (DNA SSBs)



B. γ H2AX (DNA DSBs)



DNA damage and ECV

DNA breaks in ECV patients is a pilot project of our further research of DNA damage in patients with cardiovascular diseases.

Controls were already collected and we have started recruitment of ECV patients.