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bioinformatics, and biotechnology

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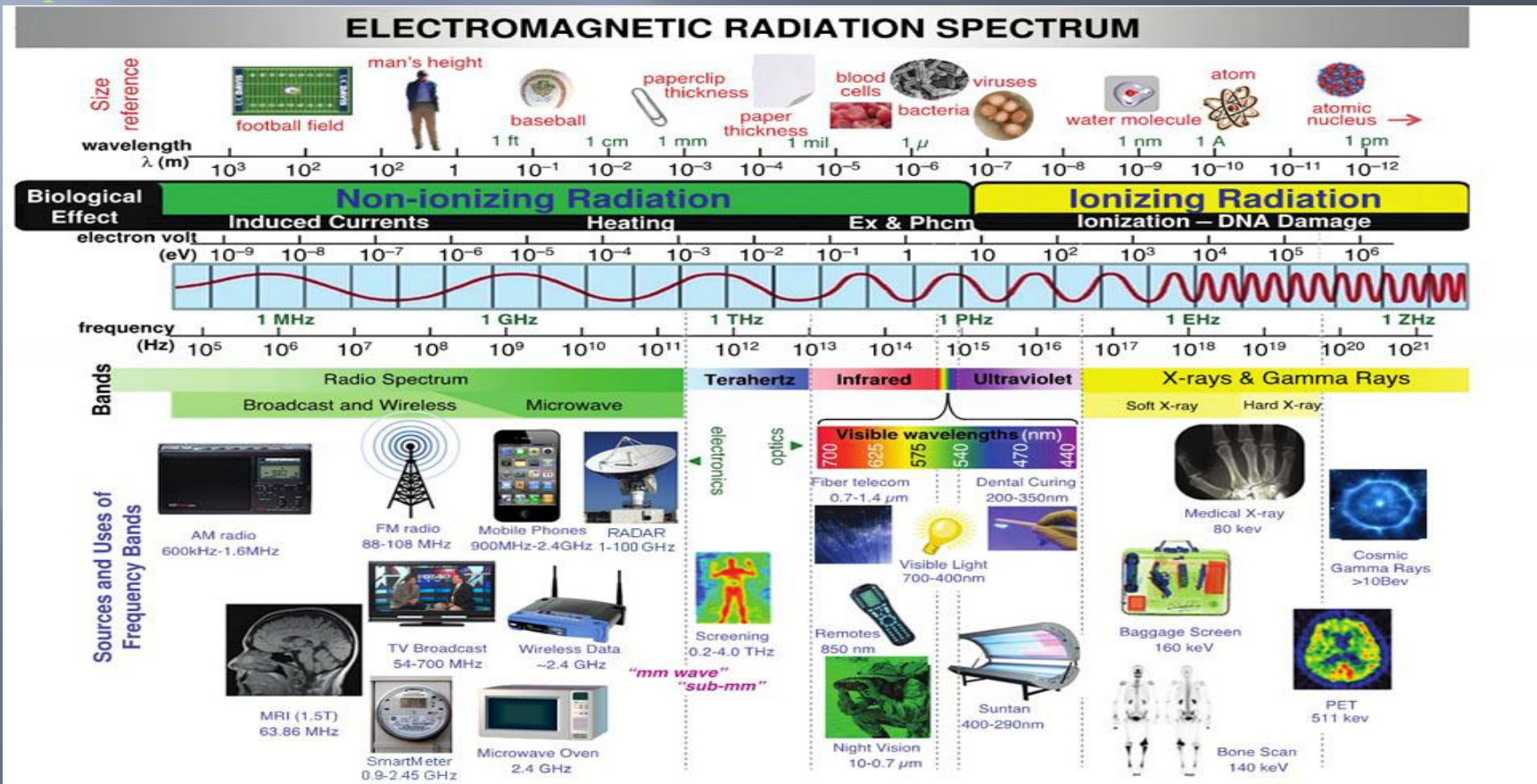


EPIGENETIC MECHANISM OF WHEAT ADAPTATION ON A RESPONSE TO THE ABIOTIC STRESS

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The aim of our research

Stress is usually defined as an external factor disadvantageous influence on the plant. These can be environmental or abiotic factors that produce stress in plants. The aim of our research is to study the nature of influence of widely spread in our environment - non ionizing radiation - mm-waves on the plants.



Stress induced both short-term and long-term effects on plant through epigenetic mechanisms

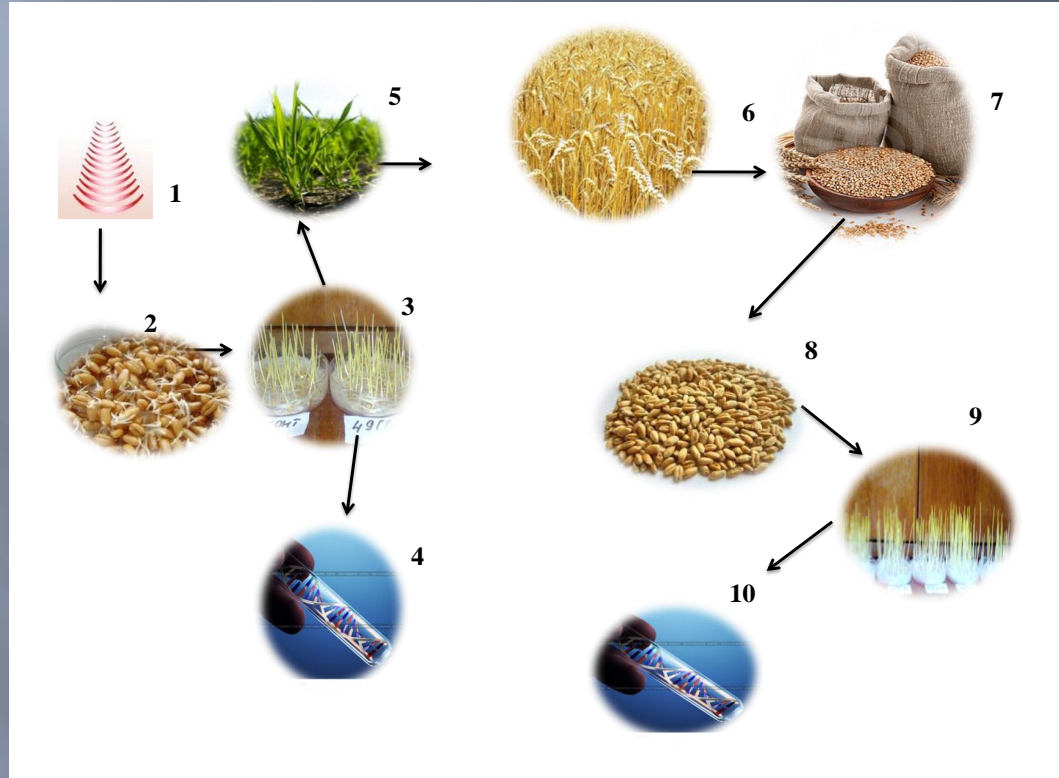
Short -term responses:

- ▣ DNA methylation
- ▣ miRNA dysregulation
- ▣ Heterochromatin decondensation
- ▣ Transposon activation

Long-term responses:

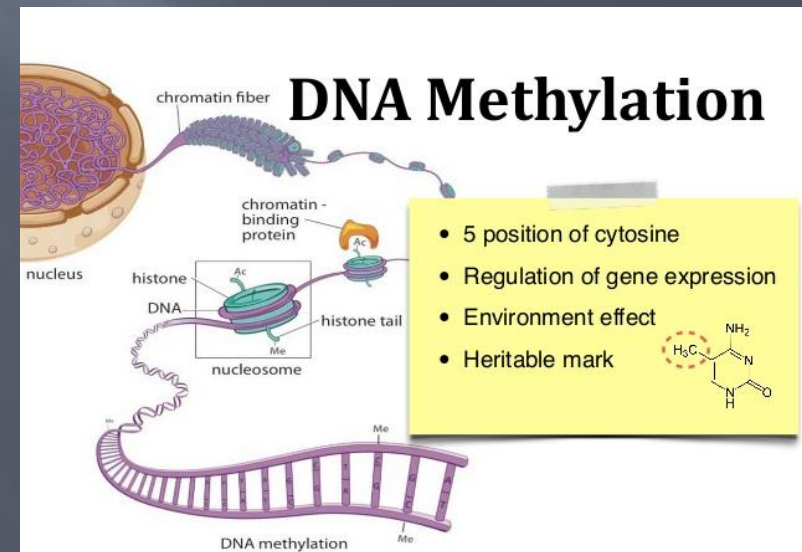
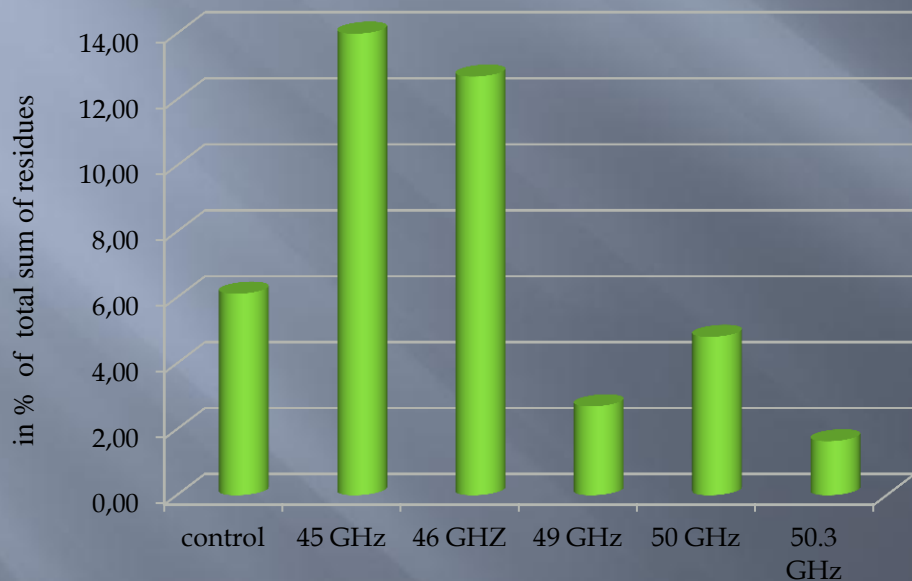
- ▣ Leaves epigenetic marks on the genome, which encode memories for future stress responses

Methodology of our research

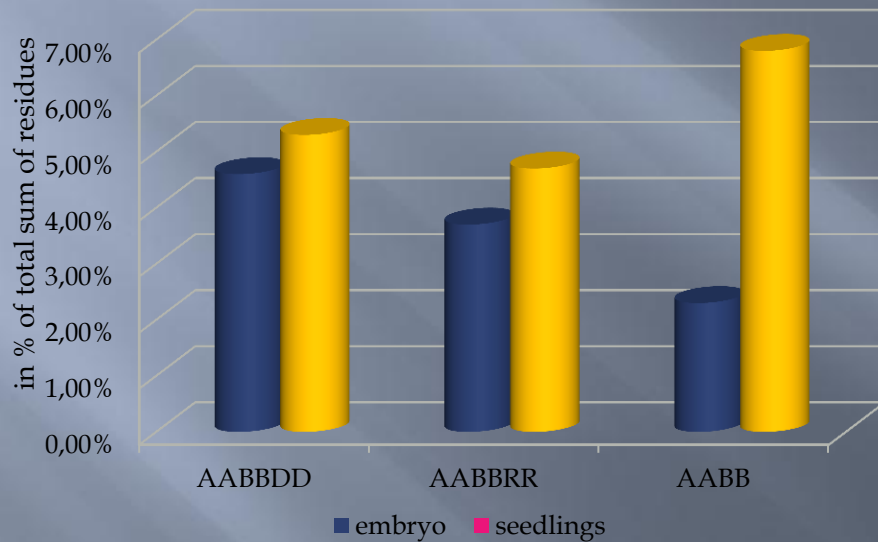


1-influence of mm-waves; 2- on wheat wet seeds ; 3- seedlings of treated seeds, 4- obtaine DNA and estimating of DNA methylation level (from first generation); 5-part of treated seeds seedlings growth in soil, 6,7,8- harvest and wheat seeds of second generation , 9- seedlings of second generation seeds (without of additional treatment), 10-isolation and estimation of DNA methylation.

A methylation of seedlings dependent from exposition of mm-waves as short-term responses (first generation)

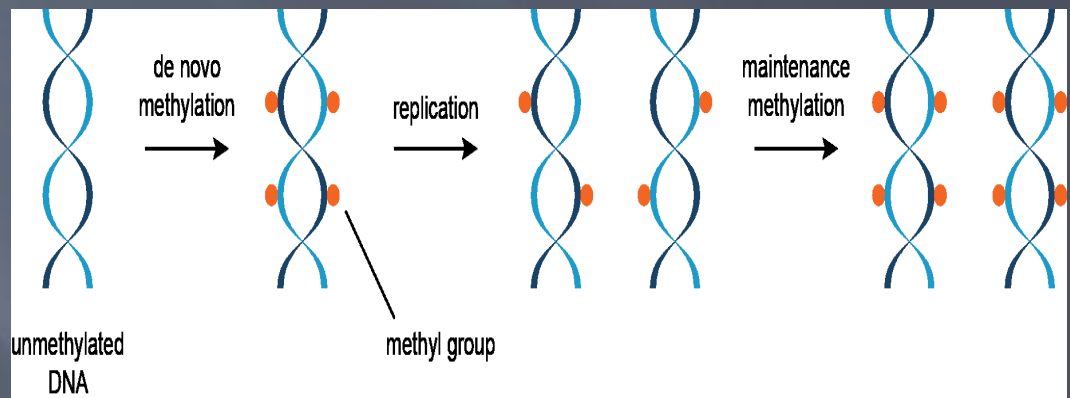


Changes in DNA-methylation during early stage of cereals growth(without of any stress)

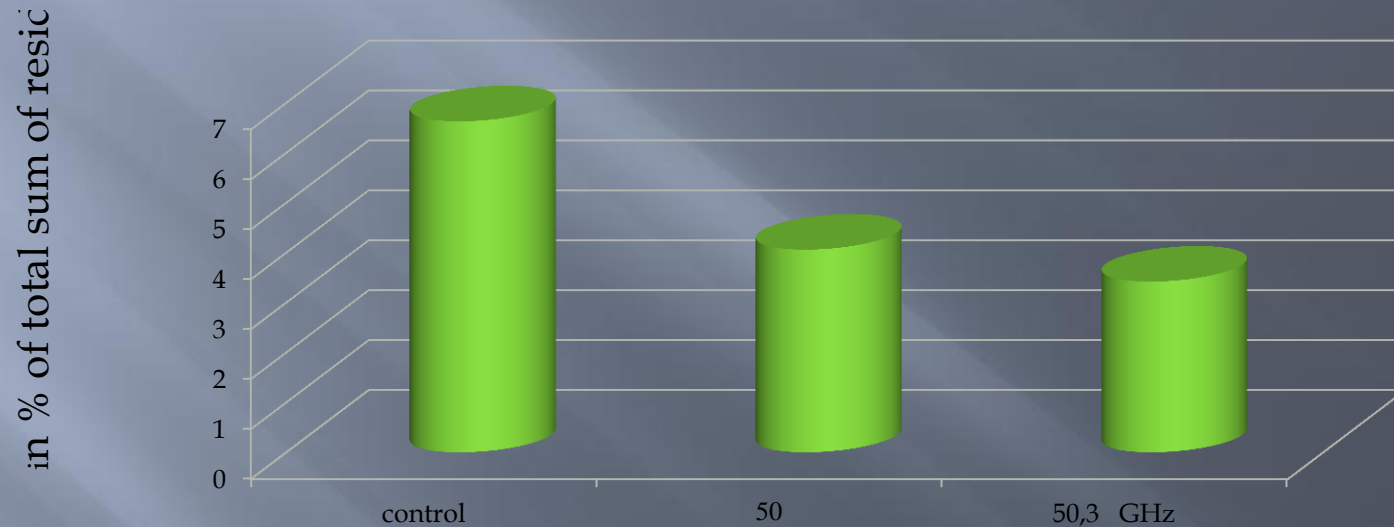


AABBDD hexaploid wheat ,
v.Voskeask by Gandilyan
AABBRR tryticale, v. Sis by
Gandilyan
AABB white spelt, v.Arshalujs
by Gandilyan

DNA methyltransferases
Dnmt3a and Dnmt3b are
responsible for catalyzing
the methylation of Cs *de
novo*



DNA methylation of seedlings obtained from second generation seeds



Obtained in our study data shows that the decreasing in level of DNA methylation in first generation of seeds treated by 50GHz and 50.3 GHz during the plant ontogeny partially conserved and pass to the seedlings obtained in second generation seeds presented on the diagram. So we have shown that changes in DNA methylation level have epigenetic character and can conserve the whole life of plant but they have shown partially pass to the next generation.



Thank you for attention



Erebouni fortress



Wild wheats of the Erebouni reserve



Qarahundj (stonehenge) in Armenia