

CAN THE ELECTROMAGNETIC WAVES HELP FOR PLANT RESILIENCE?

BOCCHINI M.*, MARCHETTI E.***, MARIANI A.*, SANTORO D. F.*, FRISULLO L. S.*,
CAPOMACCIO S.***, DIONIGI M.****, ALBERTINI E.*, MARCONI G.*

*) Dipartimento di Scienze Agrarie, Alimentari e Ambientali, Università degli Studi di Perugia, Perugia, Italy

**) CNR-IMEM, Parma, Italy

***) Dipartimento di Medicina Veterinaria, Università degli Studi di Perugia, Perugia, Italy

****) Dipartimento di Ingegneria, Università degli Studi di Perugia, Perugia, Italy

epigenetics, Arabidopsis thaliana, electromagnetic waves, DNA methylation

In the last two centuries, dating back from the industrial revolution, human activities have started to introduce significant changes in the environment due to emissions causing the current global climate transformation.

Alongside this scenario, other “emissions” such as electromagnetic waves (EM) and microwaves are producing a huge social, cultural and economic impact. These are known mainly for their application both in the form of power, with the thermal control and heating of materials (ovens), and in telecommunications, such as in mobile telephony, Bluetooth and Wi-Fi in which the wave becomes an information vector rather than energy.

With the present, preliminary, study we have found a significant and surprisingly effect of EM waves (2.45 GHz), on the growth rate and germination of *Arabidopsis thaliana* seeds. Briefly, seeds were treated with microwaves in a controlled environment for short (1 day) and long (6 days) periods of time. Phenotypic observation of these sets along with controls revealed produced plants that showed a faster growth rate and significant reduction in the life cycle. Moreover, plants were investigated for methylation changes with a genomic approach, showing significant differentially methylated regions in CG, CHG, CHH and 6mA contexts.