



## ***ABSTRACT***

### ***"Epigenetic basis of adaptation to stress in plants"***

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Plants are sessile organisms that are known for their adaptive plasticity to the changing environment. In addition to directly influencing on plant growth, environmental changes not only influence gene expression patterns but also affect the stability of the genome. Both of these responses are mediated by epigenetic mechanisms which can also cause phenotypic changes that can be transmitted and remain stable for several generations. In this respect, the formation of "environmental epialleles" and their maintenance represents an important, albeit unexplored, source of variation and adaptive power that can be manipulated to improve the way plants adapt to a changing environment. However, the precise mechanisms regulating this epigenetic phenomenon remain unknown. We have investigated the impact that abiotic environmental stress has on the formation of new allelic variants by the genome-wide epigenetic profiling. Our recent work provides evidence of small RNAs directly involved in directing DNA methylation to discrete loci of the maize genome. I will discuss the possible mechanism(s) by which environmental change is able to destabilize the plant epigenome and contribute to the so-called "epigenetic memory" and adaptation to stress in plants.