**UMR UCA\_INRAE Génétique Diversité Ecophysiologie des Céréales (GDEC)**

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**Unfolded Protein Response (UPR) and the response of cultivated wheat to heat stress.**

The Content and quality of storage proteins in the wheat grain determine the final quality of the dough during the bread-making process. Many environmental factors such as heat or nutritional (nitrogen/sulphur) stress negatively affect the synthesis and quality of these proteins. In response to these environmental stresses, the plant cells activate a number of cellular signaling and regulatory pathways that modify their physiological and molecular responses. Among them, the UPR pathway regulates the amount of unfolded proteins in the endoplasmic reticulum. Several proteins belonging to this pathway have been identified in Arabidopsis, including transcription factors and chaperone proteins. This PhD project aims at studying the role of the UPR pathway in the response of wheat to heat stress and its impact on the accumulation of storage proteins. First, this pathway and the interaction between its actors will be characterized using chemical agents that induce the UPR genes in the vegetative part and in a developing grain. Secondly, genetic material available in the laboratory with different grain composition characteristics (isogenic lines, tilling mutants) will be used to unravel the role of the UPR pathway during the protein accumulation process within the grain.

Guérin C., J. Roche, V. Allard, C. Ravel, S. Mouzeyar, MF. Bouzidi. 2019. Genome-wide analysis, expansion and expression of the NAC family under drought and heat stresses in bread wheat (T. aestivum L.)” PLoS One. 2019 Mar 6;14(3).