

Title: Glutathione facilitates regeneration and cell cycle division within the root apical meristem by modifying the chromatin landscape

Plants possess incredible regeneration capabilities, being able to reform entire stem cell niches after complete excision. During regeneration of the root stem cell niche, known as the root apical meristem (RAM), multiple cell types can reconstitute into stem cells to reform the stem cell niche. During this reconstitution process, cells undergo an accelerated and coordinated cell cycle facilitated by the influx of the tripeptide metabolite glutathione (GSH) into the nucleus during G1 and S phases. However, not much is known about the role of GSH in proliferation or its interactions within the nucleus during this process. I plan to investigate the function of GSH within the nucleus of plant root tip cells, focusing on its role in influencing the chromatin landscape of Arabidopsis. I propose that GSH interacts with and destabilizes the nucleosome complex, GSH influences histone post-translational modifications and chromatin compaction, and GSH facilitates transcriptional regulation during the cell cycle.