

Cyclic nucleotides, specifically cyclic adenosine monophosphate (cAMP) and cyclic guanosine monophosphate (cGMP) are well-established second messengers in most eucaryotic and procaryotic cells. Although they are some of the most ubiquitous second messengers in animal tissues, the significance of cyclic nucleotides in plant signaling has long been underestimated, leading to a period of neglect in plant cyclic nucleotide research. Recently, however, these molecules have been recognized as crucial components of plant signaling pathways, resulting in renewed research interest. Advanced methods tailored to studying cyclic nucleotides are now being employed to identify and characterize novel proteins involved in their signaling and to elucidate the pathways and processes they mediate. Despite the increased interest and rapid advancements in this field, our understanding of cyclic nucleotide signaling in plants remains fragmented. Numerous questions regarding their signaling mechanisms and physiological effects are emerging. This thesis aims to provide a comprehensive review of the current knowledge on cyclic nucleotides in plant signaling, highlighting significant findings and identifying critical research gaps that warrant further investigation.