

A root apical meristem is the only source of cells for all tissues in the root. The root growth relies on its function. Regulation of a cell division frequency and cell differentiation affects organization and function of the differentiated tissues and the proper meristem function. If the cell differentiation overbalances the cell proliferation, the meristem exhaustion occurs and the root growth irreversibly terminates. This thesis describes existing knowledge about regulation of the primary root apical meristem of model plants *Arabidopsis thaliana* and *Zea mays*, explains these findings in the context of plant postembryonal development and provides informations about how and under what conditions the primary root growth might be terminated.