



FACULTY OF ENGINEERING & TECHNOLOGY
DEPARTMENT OF BIOTECHNOLOGY

TISSUE SPECIFIC PROMOTERS

➤ Several types of promoters regulate gene expression

eg. Constitutive promoters

Tissue-specific or development-stage- specific promoters

Inducible promoters

Synthetic promoters

➤ Tissue specific promoters are promoter sequences on DNA of eukaryotic plant and animal cells, which enable the expression of particular gene in the specific cell type as cells of an organism contain same genetic information, some genes are turned on and others are turned off at different locations and times during the life cycle of an organism.

➤ The transgenes driven by these type of promoters will only be expressed in tissues where the transgene product is desired, leaving the rest of the tissues in the plant unmodified by transgene expression. Some examples of tissue specific promoters in plants are

❖ beta-amylase gene or barley hordein gene promoters (for seed gene expression)

❖ tomato pZ7 and pZ130 gene promoters (for ovary gene expression)

❖ tobacco RD2 gene promoter (for root gene expression)

❖ banana TRX promoter melon actin promoter (for fruit gene expression)

➤ Promoters used in animal cells Promoters and enhancer sequences are used for driving transgene in different animal. Some examples of tissue specific promoters in animals are

❖ cytomegalovirus immediate-early gene promoter (CMV)

❖ human desmin (Des) human alpha-myosin heavy chain (α -MHC)

❖ rat myosin light chain 2 (MLC-2) human cardiac troponin C (cTnC)