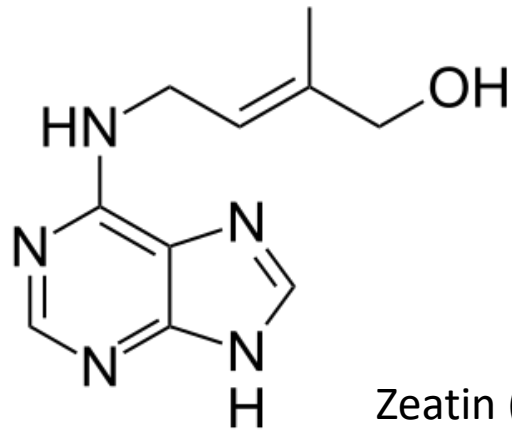
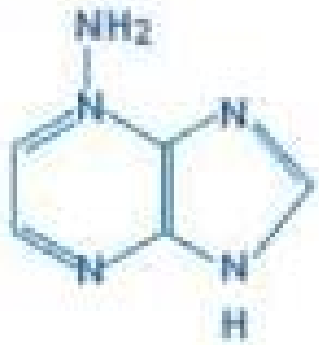


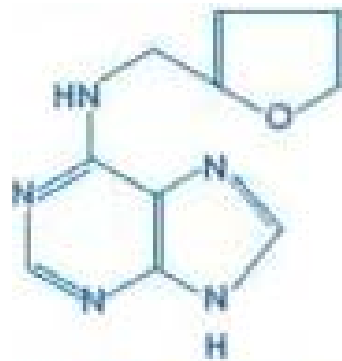
# Cytokinin



Zeatin (naturally occurring)



Adenine (related metabolite)



Kinetin (synthetic cytokinin)

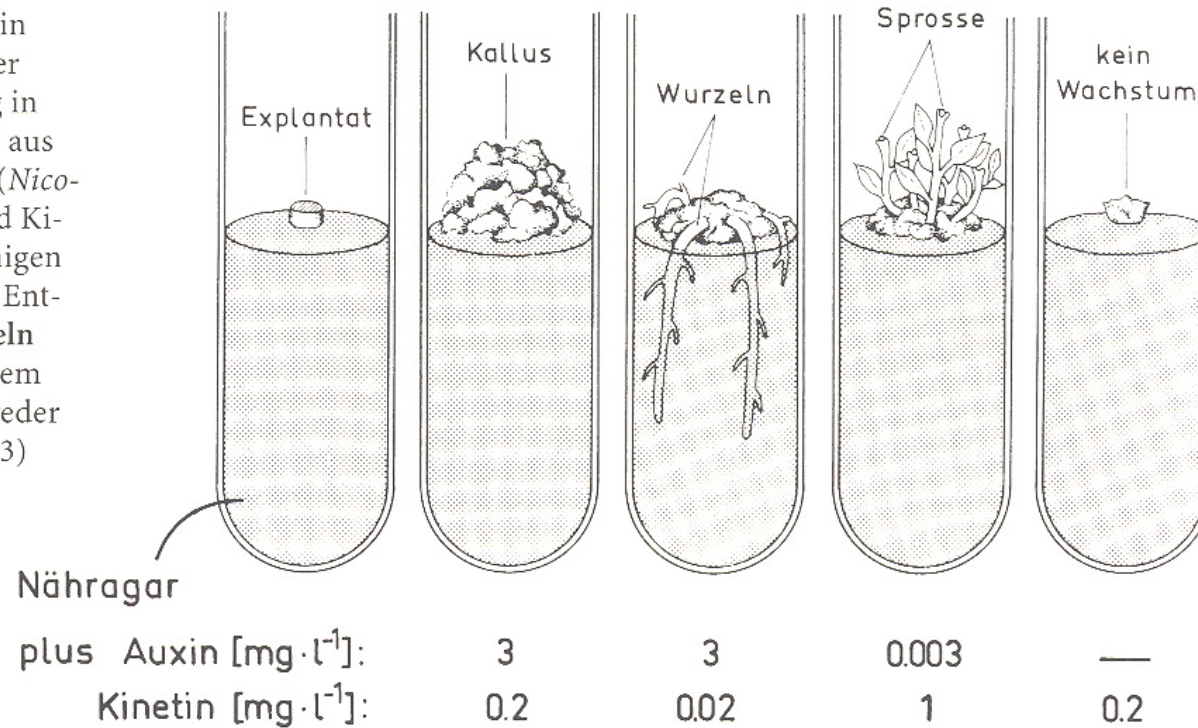
Hormone is defined by its receptor-binding ability

## Function of cytokinin

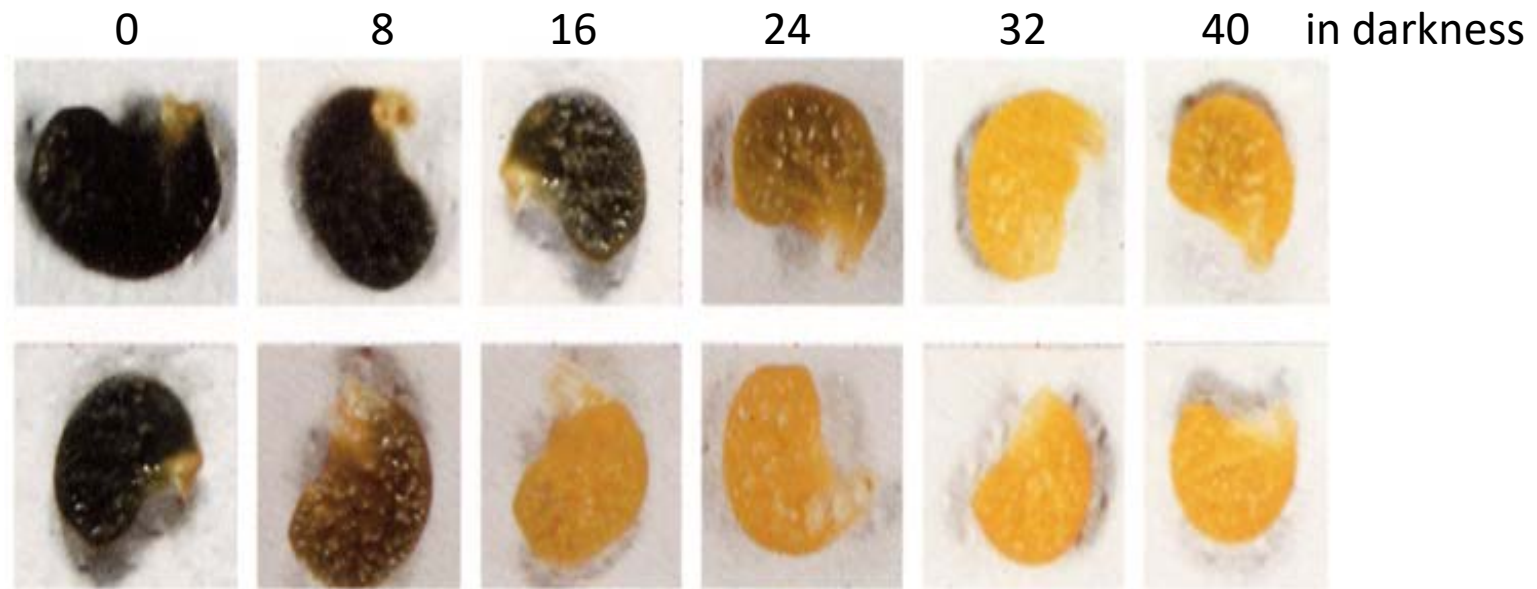
- **Cell division**
- **Retardation of senescence**
  
- **Tissue culture: auxin/cytokinin ratio determines root/shoot development**
- **active ingredient in coconut milk**
  
- **Application: retards yellowing of vegetable and fruits**
- **Used by farmers to increase the production of crops (cell division)**

# Auxin/cytokinin ratio determines root/shoot development

**Abb. 20.28.** Auxin (IAA) und Cytokinin (Kinetin) als begrenzende Faktoren der Mitoseaktivität und der Organbildung in einer Gewebekultur. Objekt: Explantat aus dem Stengelmark einer Tabakpflanze (*Nicotiana tabacum*). Relativ hohe IAA- und Kinetinkonzentrationen führen nach einigen Wochen zur Bildung eines **Kallus**. Die Entwicklung kann zur Bildung von **Wurzeln** oder **Sprossen** umgelenkt werden, indem man das IAA/Kinetin-Verhältnis entweder erhöht oder erniedrigt. (Nach Ray 1963)



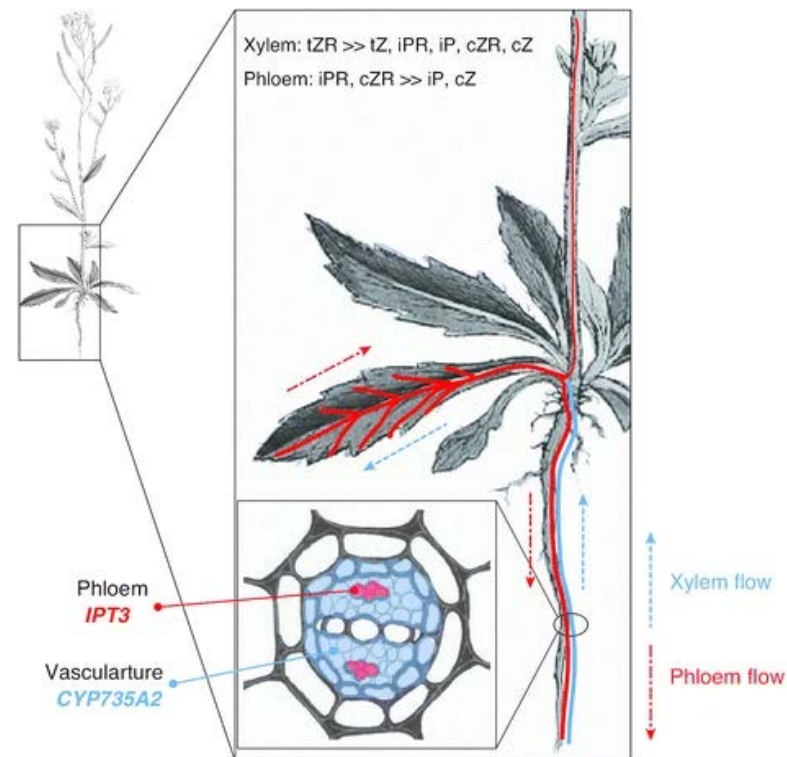
# Retards yellowing in darkness



*Lupinus luteus* cotyledons

# Biosynthesis and transport of cytokinin

- synthesized from adenin
- often: production in roots
- transport through vascular tissue to aerial parts

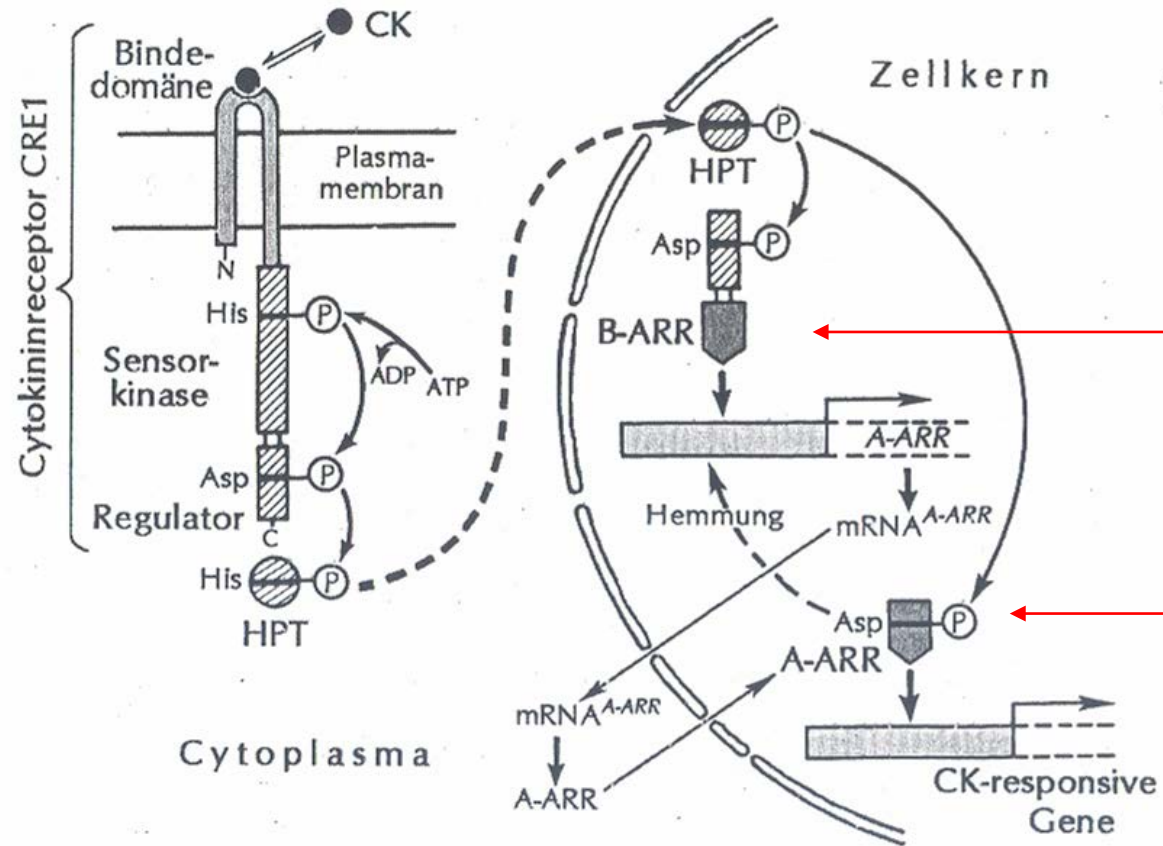


tZR is the major form of xylem cytokinins, cZR is found in phloem.

Both cytokinins are directionally translocated between organs.

# Signal transduction of cytokinin

**Receptor:  
two-component  
system**



**B-ARR: not cytokinin-regulated**

**A-ARR: cytokinin-regulated**

Ethylene and cytokinin are perceived by receptors belonging to the two-component system

Ethylene

Receptor in ER

Ethylene binding requires  $\text{Cu}^{2+}$

Without hormone: receptor is on

Cytokinin

Receptor in plasmamembrane

no ion requirement

hormone activates receptor