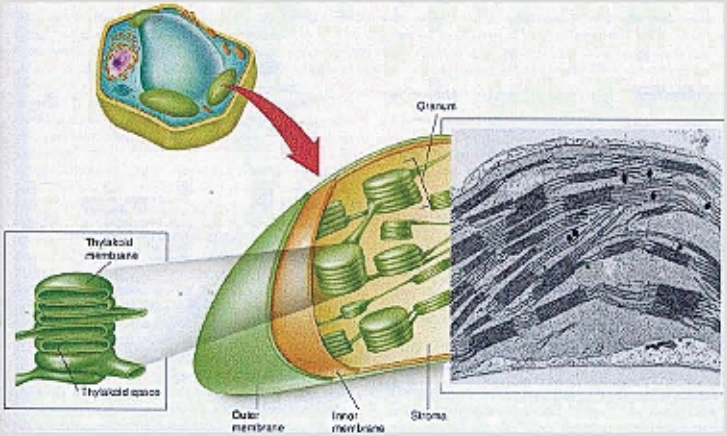
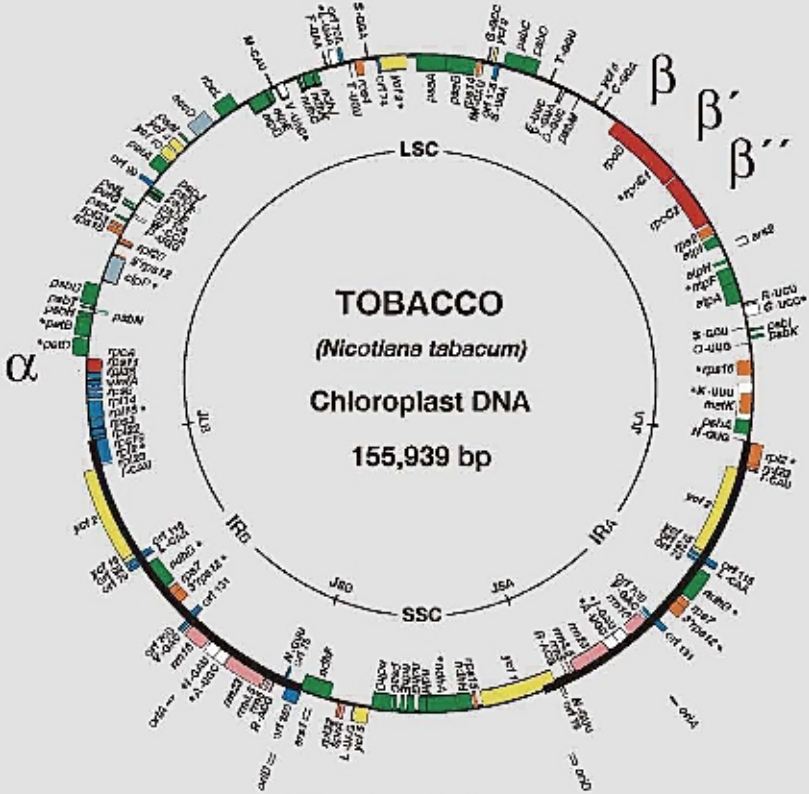
Zentrale Plastidenfunktionen



From: Berg 1997 Introductory Botany, Saunders

- **Biosynthese, Stoffwechsel**
- **Energie- und Signalvermittlung**
- **Pathogen- und Stressabwehr**
- **intrazelluläre genetische Interaktion**
- **Zelldifferenzierung, Entwicklung**

Plastidengene



Rev. Version, Sugiura 1998

Plastiden-Genexpression

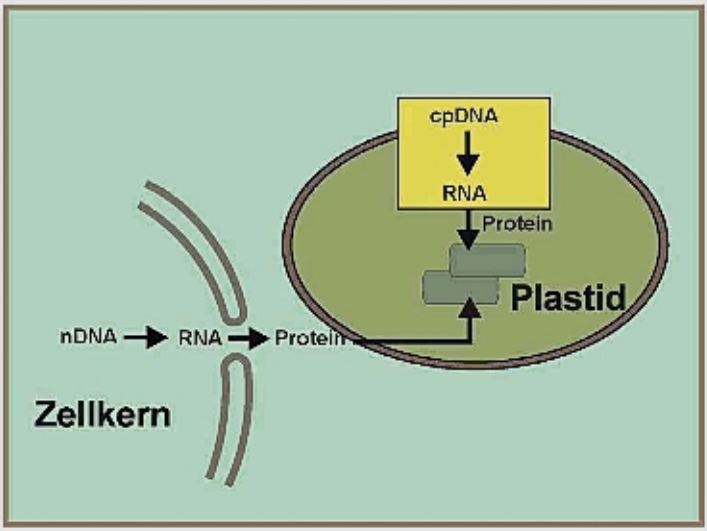
Objekte:

- Cruciferen
  Senf (*Sinapis alba*), Raps, Arabidopsis
- andere Pflanzen
  Mais, Tabak
- *E. coli*, Hefe

Systeme:

- Embryonal- u. Keimlingsentwicklung
- Photomorphogenese, Farblichtakklimation
- adulte Pflanze: Organe, Gewebe
- C4-Zelltypen (Mesophyll- u. Bündelscheiden-Z.)
- Lichtstreß, Inhibitoren, Redoxreagentien
- "Plastiden"-Mutanten (*chm*)
- transgene Pflanzen (*sense*, *antisense*, *knockout*)

Transkription bei Plastiden



- "Spieler"
- Mechanismen
- Regulation

?

Plastidentranskription: Enzyme

RNA Polymerasen

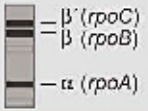
ATP
GTP
CTP
UTP → RNA + PP_i

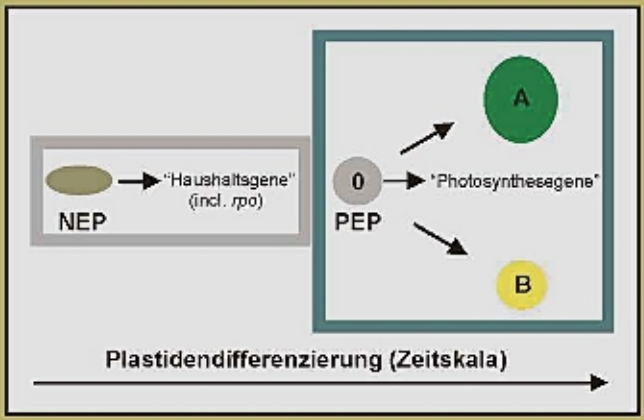
NEP

- Nuclear-Encoded Polymerase = "kernkodiert"
- "phagenähnlich" = T3, T7 Enzym (1 Untereinheit)

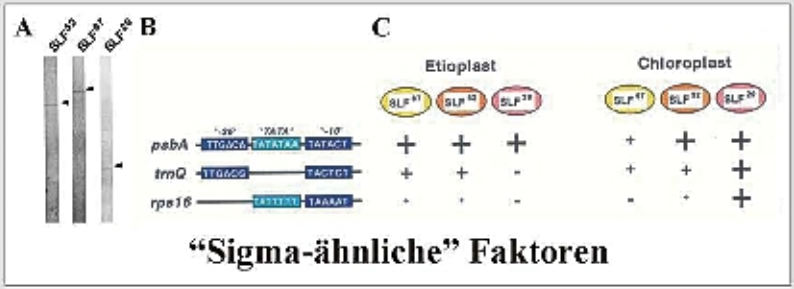
PEP

- Plastid-Encoded Polymerase = "plastidenkodiert"
- "bakterienähnlich" (mehrere Untereinheiten)



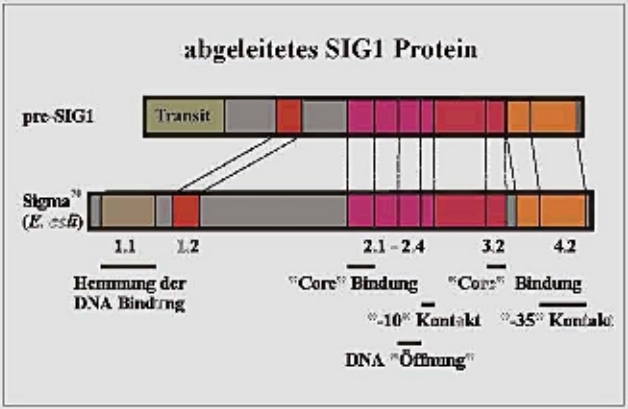


Plastidäre Sigmafaktoren / Gene



"Sigma-ähnliche" Faktoren

(Tiller et al. 1991, 1993)



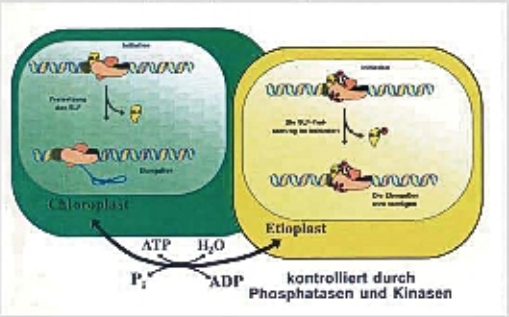
(Kestermann et al. 1998)

- Plastiden enthalten Sigmafaktoren
- Die Gene sind im Zellkern lokalisiert

→ Funktion *in vivo* und *in vitro*?

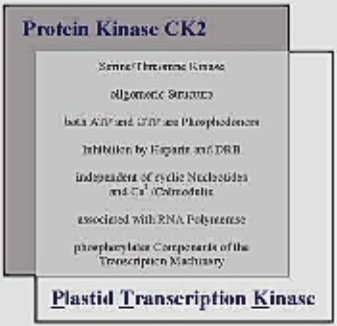
Plastidäre Transkriptionskinase (PTK)

Phosphorylierungsmodell

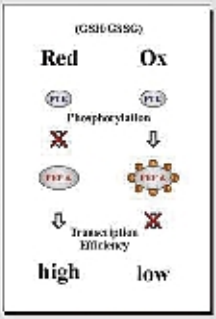


Tiller and Link 1993

PTK = CK2 ?



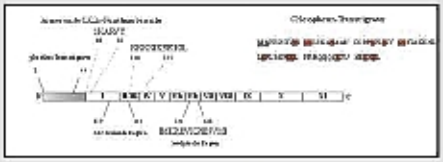
Redox-Modell



Baginsky et al. 1997, 1999

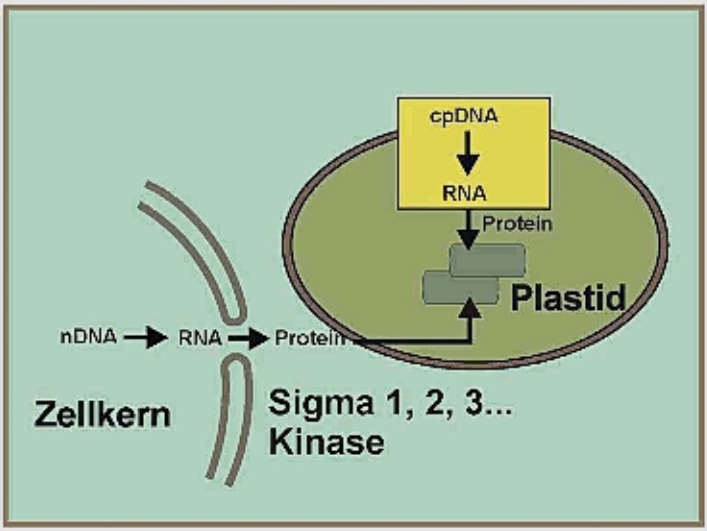
Clonierung, Überexpression, Funktionsanalyse

(K. Ogrzewalla)



PTK (CK2): Kernkodiert !

Transkription bei Plastiden



PEP (Plastid-Encoded Polymerase) ???

Kernkodiert:

- **Sigmafaktoren (Zell-, Stadium-Spezifität?)**
- **Transkriptionskinase (Redox-Regulation)**
- **Weitere?**

"Plastiden-Transkriptosom"