

Supplementary Table S2. Genetic transformation workflow of *Brassica juncea*.

Stage	Medium / Main components	Hormones and concentrations	Culture conditions	Duration
Sterile seedling culture	1/2 MS	Hormone-free	23°C, 16h light/8h dark	5–6 days
Infection and co-cultivation	CIM: MS + sucrose 15 g/L + phytagel 2.7 g/L	Acetosyringone 100 µM (only in resuspension solution)	22°C, dark	48 hours
Hairy root induction	MS + sucrose 30 g/L + phytagel 2.7 g/L + Timentin 300 mg/L	No exogenous hormones	23°C, 16h light/8h dark	14 days
Callus induction	MS + sucrose 30 g/L + phytagel 2.7 g/L + Timentin 300 mg/L	6-BA 5.0 mg/L + NAA 0.5 mg/L	23°C, 16h light/8h dark	20 days (visible callus)
Shoot induction	MS + sucrose 30 g/L + phytagel 2.7 g/L + Timentin 300 mg/L	6-BA 0.5 mg/L + NAA 0.5 mg/L	23°C, 16h light/8h dark	30 days (callus mass and shoot primordia)
Plantlet formation	MS + sucrose 30 g/L + phytagel 2.7 g/L + Timentin 300 mg/L	IBA 0.1 mg/L + NAA 0.2 mg/L	23°C, 16h light/8h dark	About 14 days (acclimatization and transplanting after rooting)