

Biolistic Particle Delivery System

The delivery of nucleic acids into cells by firing nucleic acid-coated microparticles into them.



PDS-1000/He

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Advantages of Particle Delivery

- simple, rapid, versatile technique
- targeted intracellular gene delivery
- independent of cell type
- uses small amounts of DNA
- delivers single or multiple genes
- no carrier DNA needed
- can deliver large DNA fragments
- no extraneous genes or proteins delivered
- requires little manipulation of cells
- high reproducibility



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- for *in vitro*, *ex vivo* (and *in vivo* for some plants + microbes)
- applications for animal cell and organ culture, plant cell culture and explants, pollen, insects, algae, fungi and bacteria
- pressure range 450 - 2200 psi gives flexibility and penetration - ideal for plant applications
- large target area - more cells can be transformed



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PDS-1000/He - Target Cells

- *In Vitro* - Animal cells & organ cultures, plant cells, organelles
- *Ex vivo* - Plant explants and Pollen
- *In vivo* - Some plants, insects, algae, fungi, bacteria & other microbes



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PDS-1000/He - Research Fields

- Gene expression studies
- Agricultural biotechnology and crop improvement - Plant Vaccines
- Disease resistance

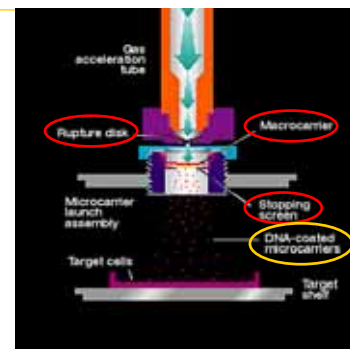


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PDS-1000/He - Bombardment

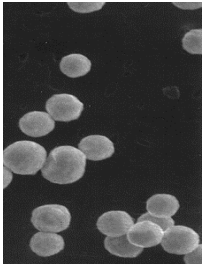


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Gold Microcarriers



- 165-2262 **0.6 μm** Gold Microcarriers
- 165-2263 **1.0 μm** Gold Microcarriers
- 165-2264 **1.6 μm** Gold Microcarriers



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PDS-1000/He Sample Prep

DNA-coated
Microcarriers

Macrocarrier



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PDS-1000/He Rupture Disk

Rupture Disk



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PDS-1000/He Macrocarrier Assembly

Stopping Screen

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PDS-1000/He Loading Target Cells

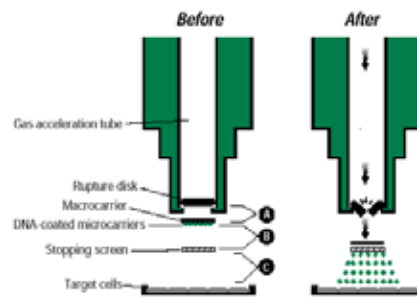


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PDS-1000/He Bombardment



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PDS-1000/He Delivery Parameters

	Vacuum ins Hg	Target dist cm	Helium psi	Particle Size
Bacteria	29	6	1100	M5 Tungsten
Yeast	28	6	1300	0.6m gold
Algae	29	6	1300	0.6m gold
Plant cells	28	9	1100	1.0m gold
Animal cells	15	3	1100	1.6m gold

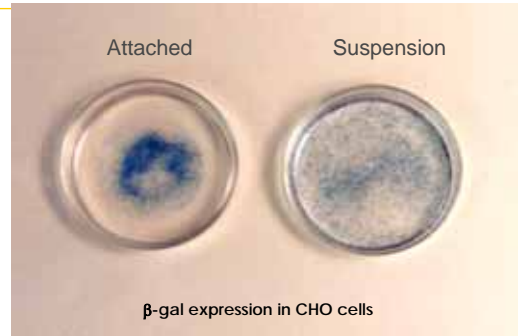


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Transformation *in vitro*



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Transgenic Barley

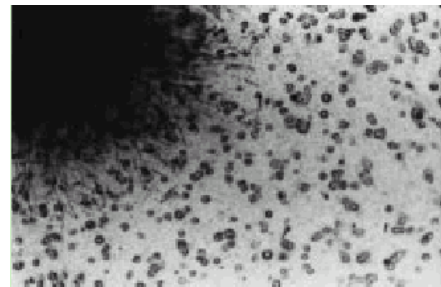


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Transformation of *Aspergillus nidulans*



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PDS-1000/Hepta



- Adapter splits helium 7 ways
- Enables larger area of cells to be transformed
- Ideal for high throughput
- Applications include animal cell and organ culture, plant cells and explants, yeast and bacteria



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PDS-1000/Hepta



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Helios vs PDS

	Helios Gene Gun	PDS1000/He
Experimental Conditions	In situ, in vitro In vivo, ex vivo	In vitro, ex vivo in vivo (plants)
Target area	small (2cm ²)	large (40cm ²)
Pressure range	100-600psi	450-2200psi
Type of target	Animals: any tissue exposed to barrel; skin, organs; cell, explant and organ culture Plants: field and Greenhouse use, Plant cell culture and explants Yeast, bacteria, microbes	Animal: cell and organ culture Plants: small intact plants, cultures and explants yeast, bacteria microbes



Biolistic Particle Delivery

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Thank you for attention !

