WEALTEC

GDS - 80

Low Pressure Gene Delivery System

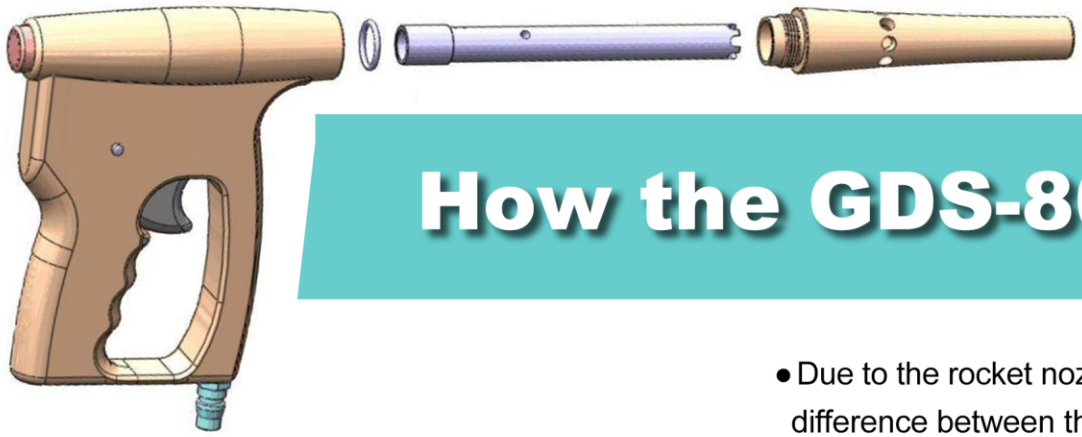
Gene Delivery System

Supersonic Gas Flow for Gene Delivery

The GDS-80 Low Pressure Gene Delivery System is a handheld gene delivery device that propels the DNA, RNA, or biomaterial coated gold microparticles near the speed of sound at low helium gas pressure.

The aerodynamic design of the spray nozzle barrel allows the gas flow to achieve supersonic speed, thus accelerating the microparticles to near sonic speed.

The microparticles with such high-speed momentum can penetrate the epidermal cell, through the cell wall and cell membrane. With or without the microparticles, the GDS-80 reduces cell damages and enhances efficiency of transformation due to the low gas pressure requirement.



How the GDS-80 Works

Transfer of biomaterials using GDS-80 is simple and easy without too much prior preparation; simply load nucleic acids coated microparticles, or even naked nucleic acids directly into the sample loading sleeve, point the nozzle at the target cells, and pull the trigger.

- Due to the rocket nozzle design, the pressure difference between the inside and the outside of the nozzle spray barrel propels the sample near sonic speed.
- Thus, the sample becomes atomized and is capable of penetrating epidermal cell, through the cell wall and membrane.
- Transfer efficiency can be adjusted with the sample concentration, pressure and distance between the nozzle spray barrel and the target cells to find the optimal condition.

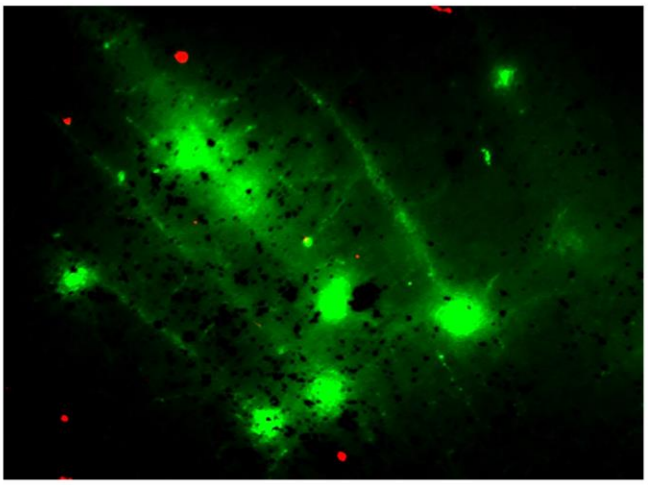
Typical Workflow of GDS-80 vs. Other Particle Bombardment Systems

Biolistic bombardment system A	Biolistic bombardment system B	BEST GDS-80
Prepare the sample with microparticles	Prepare the sample with microparticles	Prepare the sample with or without microparticles
Coat the microparticles along the inside of plastic tubing	Place a rupture disk in the unit for each shot	
Cut the tubing into small cartridges	Evacuate the air in the bombardment chamber	Load the sample in the sample loading sleeve
Load the cartridge to the gene gun	Load the sample in the bombardment chamber	
Fire the sample		

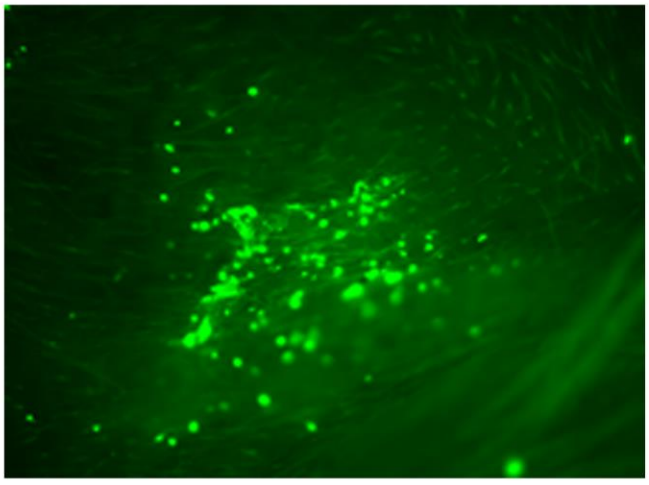
Applications

Animal Cells

Due to the low-pressure requirement, the gene gun GDS-80 can propel low density particles in supersonic flow without damaging the target cells or the nucleic acids samples. Two methods of inoculating plasmid DNA can introduce animal cells in vivo: delivery of gold-coated plasmid DNA and direct delivery of naked plasmid DNA. Studies have shown the two methods can trigger different immune response in mice. This feature is excellent in studying vaccination and gene therapy in animal.

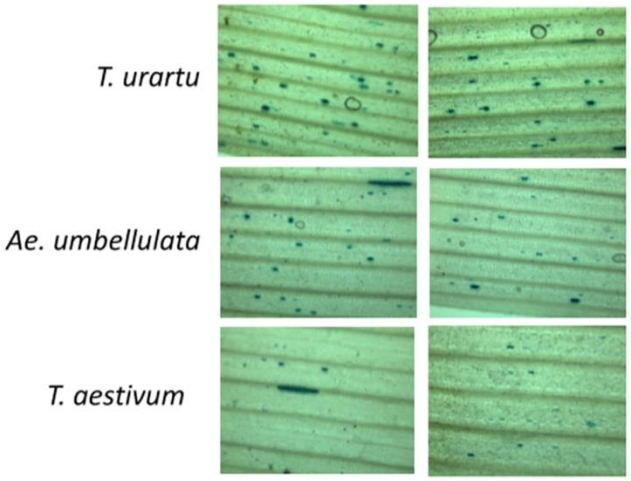


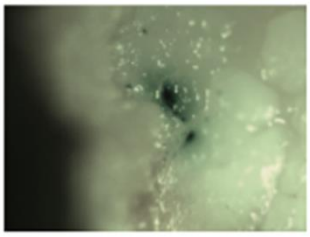
Sample: Mice Brain Slices
Reporter gene: Two dye
Accessory: Cell Strainer
Observation: Flourenscence microscope



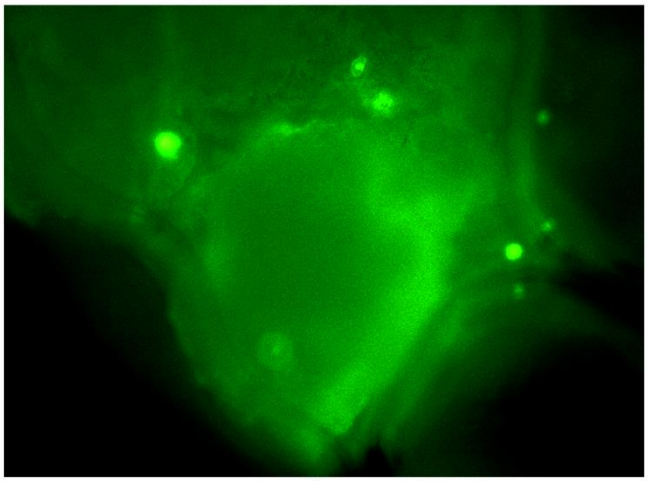
Sample: Skin of Mice abdomen
mhGFP + gold (plasmid 1ug Gold 1mg / shot)
Observation: Flourenscence microscope

Figure 1 Transient expression of the GUS reporter gene in the leaves of *T. urartu*, *Ae umbellulata*, and *T. aestivum* and callus of *T. durum*.

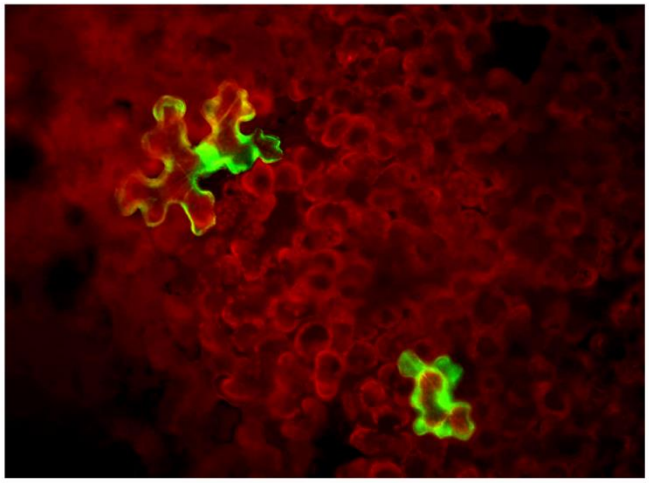




T. durum callus



Sample: Oryza sativa L. Callus
Reporter gene: GFP
Accessory: UTS-10
Observation: Flourenscence microscope



Sample: Nicotiana tabacum Leaf (in vivo)
Reporter gene: GFP
Accessory: LC-10
Observation: Flourenscence microscope

Plant Cells

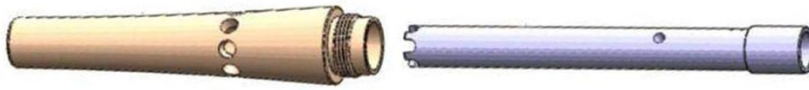
The handheld GDS-80 provides wide possibilities for gene transfer in plant tissues both in vivo and in vitro in a controlled environment such as green house. Extensive research papers have proven that GDS-80 is flexible and efficient for gene transfer in plant cells without causing severe damage to the target plant cells. Among many plant cells, leaves, epidermal cells, embryos, seedlings, and floral tissues have been transformed successfully.

GDS-80 Components

Sample loading sleeve

All-around Flexibility

made of stainless steel and consists of 8 sample loading holes which allow loading sample at different angles or positions



4.5/10 mm diameter nozzle spray barrel set

Patented Design

autoclavable 4.5 mm and 10 mm inner diameter nozzle spray barrels are suitable for plant and animal cells, respectively

Gas pressure regulator

Fine-tuning Capability

comprised of two pressure gauges and a regulator with a flow meter, limiting the maximum pressure not exceeding 80 psi and damaging the trigger

Accessories

Target Spacer

The 3 cm and 6 cm fixed height stainless steel Target Spacers are ideal for optimizing pressure and sample concentration.

Universal Target Spacer UTS-10

The Universal Target Spacer includes LC-10/LC-5 Leaf Clamps and other accessories for powdery targets such as pollen tissues.

O-rings

Easy Maintenance

assembled inside of the main body and prevents gas leakage

GDS-80 main body

Robust Construction

made of stainless-steel

Hose assembly

Hassle-free Assembly

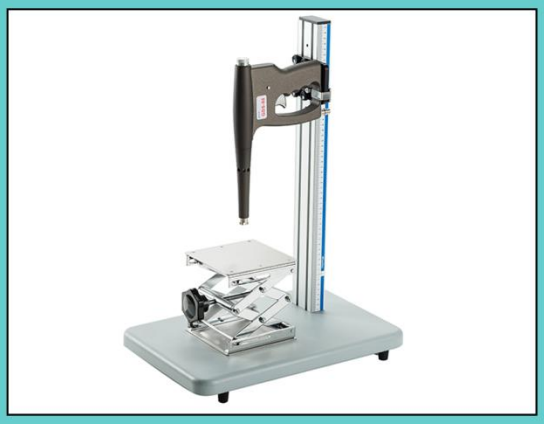
comprised of double-sided stainless-steel quick connectors. No tools required for gun-hose assembly

Advantages

- Versatile to apply to a wide range of targets
- Not limited in transient expression
- Non-coated plasmids can be delivered to target cells directly
- Two types of nozzle spray barrels are available to choose: plant and animal
- Nozzle spray barrels can be autoclaved
- Easy preparation and simple operation

Leaf Clamps LC-10/LC-5

The Leaf Clamps specialize in targeting and positioning leaves in different sizes in vivo or ex vivo. The distance arm allows users to define the distance between the target and the opening of the nozzle spray.



GDS-80 Stand

The GDS-80 Stand allows firing sample consecutively at a distance defined by users. It is ideal for targeting cells in a Petri dish.

Ordering Information

Catalog No.	Description
1081001	GDS-80U Low-pressure Gene Delivery Universal System for Plant & Animal, complete with mainbody, 4.5 / 10mm diameter barrel set , gas pressure regulator, hose assembly, O-ring, sample loading sleeve, controlled temperature sample preparation device (1093001) and instruction manual
1081002	GDS-80P Low-pressure Gene Delivery System for Plant, complete with mainbody, 4.5mm diameter barrel, gas pressure regulator, hose assembly, O-ring, sample loading sleeve, controlled temperature sample preparation device (1093001) and instruction manual
1081003	GDS-80A Low-pressure Gene Delivery System for Animal, complete with mainbody, 10mm diameter barrel, gas pressure regulator, hose assembly, O-ring, sample loading sleeve, controlled temperature sample preparation device (1093001) and instruction manual

Catalog No.	Accessories
1081011	Spread even calibration kit, complete with 1081201 target spacer x 1, 1081202 target spacer x 1 and 1035106 Blotting paper, 75 x 110mm, 50pcs
1081121	UTS-10 Universal Target Spacer, complete include variable distance arm, lid stopper, hollow supporter, pollen cup, shielder (20mm x1, 35mm x1, 50mm x1), tetra-claw leaf clamp, sample support x 2 and sample soft bed x 5 for use in live plant transfection
1081122	LC-10 Leaf clamp, complete include variable distance arm, supporter, tetra-claw leaf clamp, sample soft bed x 5 for live plant use only
1081123	LC-5 Leaf clamp, complete include variable distance arm, supporter, small tetra-claw leaf clamp (Ø=15mm), sample soft bed (Ø=14.8mm) x 5 for live plant use only
1081131	GDS-80 distance-adjustable stand for quick pick and place

Catalog No.	Consumable
1081303	0.6 m gold microcarrier, 0.25g / pk μ
1081304	0.6 m gold microcarrier, 1g / pk μ
1081307	1.0μm gold microcarrier, 0.25g / pk
1081308	1.0 m gold microcarrier, 1g / pk μ
1081309	1.6 m gold microcarrier, 0.25g / pk μ
1081310	1.6 m gold microcarrier, 1g / pk

Wealtec Corp.
1885 Meadowvale Way,
Sparks, NV 89431, USA
Tel: +1-775-351-2066 Fax: +1-775-351-2077
E-Mail:sales@wealtec.com

Wealtec Bioscience Co., Ltd.
27F., No.29-1, Sec. 2, Zhongzheng E. Rd.,
Danshui Dist., New Taipei City 251, Taiwan
Tel: +886-2-8809-8587 Fax: +886-2-8809-8589
Web-site:http://www.wealtec.com