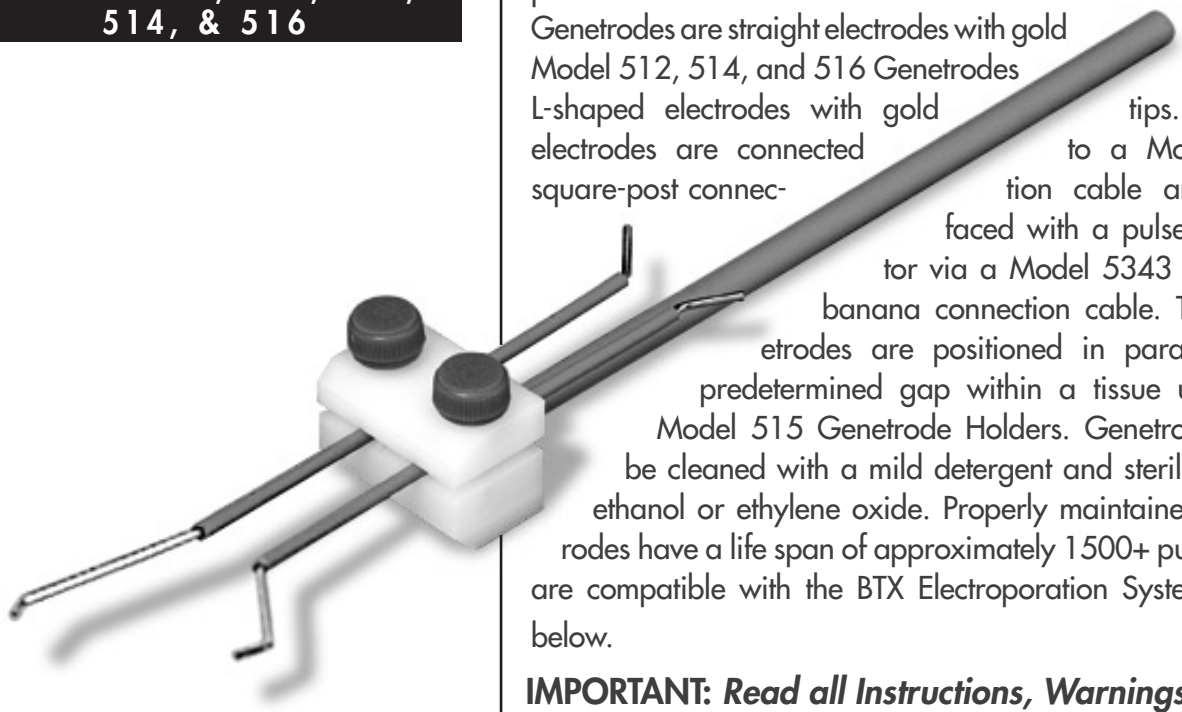
Genetrodes™

INSTRUCTIONS
MODELS 508, 510, 512, 514, & 516



The BTX Genetrodes are needle-style reusable electrodes that are used for a variety of applications. Genetrodes come in five models, with each model consisting of a pair of electrodes. The Model 508 and 510 Genetrodes are straight electrodes with gold tips. The Model 512, 514, and 516 Genetrodes are bent L-shaped electrodes with gold tips. These electrodes are connected to a Model 465 square-post connection cable and interfaced with a pulse generator via a Model 5343 coaxial - banana connection cable. The Genetrodes are positioned in parallel at a predetermined gap within a tissue using the Model 515 Genetrode Holders. Genetrodes may be cleaned with a mild detergent and sterilized with ethanol or ethylene oxide. Properly maintained Genetrodes have a life span of approximately 1500+ pulses, and are compatible with the BTX Electroporation Systems listed below.

IMPORTANT: ***Read all Instructions, Warnings and Precautions prior to use.***

FOR RESEARCH PURPOSES ONLY

ELECTRICAL & TECHNICAL SPECIFICATIONS

Standard Capabilities *Depending on buffer composition and generator capability

Voltage Range:	0 - 200 Vdc
Pulse Length/Time Constants Range:	1 µsec - 99 msec
Pulse Number Range:	1-99 (depending on voltage)
Operating Temperature:	5° - 40° C
Intended Use:	Indoor Use
Relative Humidity:	20-80%
Maximum Altitude:	2000m (6562 ft)
Pollution Degree:	II
Insulation Category:	CAT I

Physical Characteristics	**508**	**510**	**512**	**514**	**516**
Electrode Length:	5 mm	10 mm	5 mm	3 mm	1 mm
Tip Configuration:	Sharp	Sharp	Blunt	Blunt	Blunt
Shaft Configuration:	Straight	Straight	L-shaped	L-Shaped	L-shaped

All electrode tips are gold plated and 0.5 mm in diameter.

Genetrode Holder gap: 1-10mm

Compatibility

Generators: ECM 630, 830, 2001, 600, & T820.

Monitoring: Enhancer 400 recommended

BTX®

The Electroporation Experts

DEFINITION OF SYMBOLS

Warning – Refer to instructions for use in order to find the nature of any potentional hazard and any actions which have to be taken.

Caution – Risk of electric shock. Dangerous voltage that could result in injury or loss of life.

SAFETY GUIDELINES

Review the following safety precautions to avoid injury and prevent damage to this product or any products connected to it. To avoid potential hazard, use this product only as specified. Only qualified BTX personnel should perform service procedures.

Arcing can occur at high voltages. An unfavorable combination of parameters such as high voltage settings and a small sample volume with a highly conductive medium might lead to flashover between the electrodes (ARC) and/or explosive evaporation of the medium. Reduce voltage or pulse length to avoid repeating this condition.

Do not operate with suspected failures. If you suspect there is damage to the product, have it inspected by qualified BTX service personnel.

Do not contact electrodes. To avoid fire or shock hazard, observe all ratings and markings on the product or in the manual before using the device.

Avoid exposure to contact. Do not insert fingers or try to remove electrode or sample during pulsing sequence.

Wear proper eye protection during electroporation.

Do not operate in an explosive environment.

Do not operate in wet/damp conditions.

INSTRUCTIONS FOR USE

WARNING HIGH VOLTAGE. Make sure the BTX Pulse Generator is switched off before continuing.

1. Using the Model 515 genetrode holder, loosen the two plastic screws and separate the top half of the positioning plate from the holder. Place the pair in predetermined slots based on the necessary gap distance. The electrodes should extend from the holder in the opposite direction of the holder handle. Secure the electrodes by reassembling the holder and tightening the two screws.

2. Attach the Model 465 square-post cable to the gold plated electrode leads of the Genetrodes. Verify a firm connection between cable 465 and the electrodes. Ensure that no exposed metal exists between the square post connector and the leads on the Genetrodes.

3. Attach the BNC-male end of Model 5343 coaxial-banana connection cable to the BNC-female end of cable 465. Push the banana plugs of cable 5343 into the voltage output of the BTX Pulse Generator. Warning: Make sure the generator is turned off prior to connecting any cables to it.

4. Prepare tissue and sample for electroporation.

5. Following instructions for the BTX Pulse Generator, set the appropriate parameters on the generator.

6. Place the Genetrodes on the sample using a micromanipulator or manually position the Genepaddles.

7. Deliver the electroporation pulse(s) to the sample.

8. Remove the electrodes carefully and prepare for the next experiment. Clean the Genetrode Holder and the gold plated electrode base of the Genetrodes with a soft cloth or tissue. If necessary, moisten the cloth or tissue with a dilute detergent solution. Clean the Genetrode tips between experiments by washing with a mild detergent using a cloth or soft bristled brush. Alternatively, the Genetrode tips can be placed into an ultrasonic water bath and cleaned with mild detergent under sonication.

TROUBLESHOOTING

Please contact BTX Technical Service at any of the numbers listed on the following page in the event of any failure.

WARRANTY

The BTX Instrument Division of Genetronics, Inc. (Genetronics) warrants that Genetrodes are free of defects at time of delivery to the user. If a defect is found, product may be returned for exchange only within a period of 90 days from time of delivery from BTX or an authorized Genetronics Distributor. If any defects covered by this warranty appear within the above period, Genetronics shall have the option of repairing or replacing the product at its expense. Such repair or replacement shall be the customer's exclusive remedy for breach of warranty or for negligence. This warranty does not extend to any product which has been (a) subjected to misuse, neglect, accident or abuse, (b) repaired or altered by anyone other than Genetronics without Genetronics' express and prior approval, (c) used in violation of instructions furnished by the BTX Instrument Division of Genetronics, Inc. Manufacturer shall not be liable for any special or consequential damages or for loss, damage or expense (whether or not caused by or resulting from Manufacturer's negligence) directly or indirectly arising from use of the product sold here under either separately or in combination with any other product or from any other cause.

The above warranty shall be in lieu of and excludes all other expressed or implied warranties of merchantability, or fitness for any purpose, or otherwise. Without limiting the generality of the foregoing, Manufacturer shall not be liable for any claims of any kind whatsoever, as to the product delivered or for non-delivery of equipment, and whether or not based on negligence.

Manufacturer will correct any malfunction not caused by operator abuse at no charge for parts and labor. All service under the warranty will be made at the Genetronics, Inc. San Diego, California, USA facilities or at another location approved by Genetronics, Inc. Owner will ship product prepaid to San Diego, California. Manufacturer will return the product, after servicing, freight prepaid to owner's address.

Warranty is VOID if the product is changed in any way from its original factory design or if repairs are attempted without written authorization by Manufacturer.

Warranty is VOID if parts or connections not manufactured by Manufacturer are used with a BTX product.

TECHNICAL & CUSTOMER SERVICE

BTX® is the ultimate resource for technical information on the use of high voltage electric fields for performing high efficiency cell fusion, embryo manipulation, gene transfer, bacterial transformation and general electroporation of molecules and drugs into cells. We constantly track and monitor all scientific publications in this area. Our Technical Service group extracts and enters pertinent information, such as results and parameters from these papers into a Database Management System. The resultant database can be accessed and searched on any combination of the field identifiers.

For technical assistance or information, contact the BTX Instrument Division of Genetronics, Inc. Technical Service group:

Phone: 1-800-597-0580 1-858-597-6006
Fax: 1-858-597-9594
E-mail: tech@genetronics.com

If outside the United States and Canada: call 858-597-6006 or contact your nearest BTX Distributor.

BTX®
A Division of Genetronics, Inc.
11199 Sorrento Valley Road
San Diego, CA 92121-1334 U.S.A.

For any inquiry or request for repair service, contact the BTX Instrument Division of Genetronics, Inc. Customer Service group in writing or by the following:

Phone: 1-800-289-2465 1-858-597-6006
Fax: 1-858-597-9594
E-mail: cust@genetronics.com

If outside the United States and Canada, call 1-858-597-6006 or contact your nearest BTX Distributor.

ORDERING INFORMATION

Model	Description	Part Number
508	*In vivo* straight electrode w/ 5mm gold tip	10-001849-01
510	*In vivo* straight electrode w/ 10mm gold tip	10-001849-02
512	*In ovo* L-shaped electrode w/ 5mm gold tip	10-001850-01
514	*In ovo* L-shaped electrode w/ 3mm gold tip	10-001850-02
516	*In ovo* L-shaped electrode w/ 1mm gold tip	10-002509-01
515	Genetrode Holder	10-002560-01
465	Square-Post Connection Cable	06-700044-01
5343	Coaxial-Banana Connection Cable	06-700042-01
4001	Enhancer 400 w/ Computer & Printer	01-001483-01