
# NEVROTECH

Product Catalog

January 2018

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# 01

# ABOUT US

# HISTORY

Nevrotech is a global provider of neural Microelectrodes, Peripheral Electrodes and Multichannel Arrays. It forms part of POLARITÁS – GM Kft. (www.polaritas.com), one of the world's leading technology specialist of the canoe-kayak and rowing sports. Polaritás holds numerous patents with ISO certified products sold in 40+ countries, and it is a four-time consecutive supplier of the Olympic Games. Polaritás was established in 1984 and it is headquartered in Budapest, Hungary.

# APPROACH

We are equipped with decades of experience in technological research and development and we have accumulated significant amount of expertise in neural probe design and production. Working closely with our R&D collaborators, we are committed to delivering high-quality neural probes, meeting all customization needs (even beyond the listed parameters) and providing unparalleled customer support at any scale.

# QUALITY

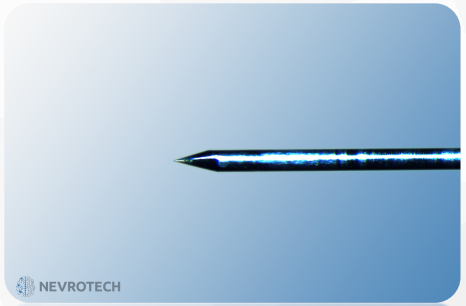
We have built an extensive quality management system for both probe components and designs. This quality assurance drives the highly reliable and reproducible performance of our neural probes.

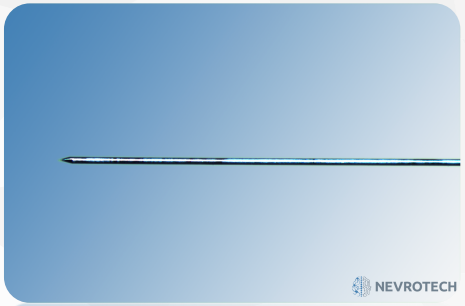
# 02

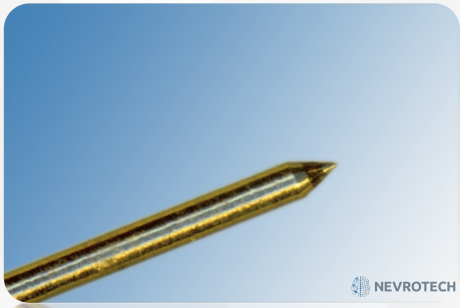
# MICRO-ELECTRODES

- Concentric Electrodes
- Heptode Magic Pencil

# Concentric Electrodes




## DESCRIPTION

Concentric electrodes are designed for bipolar electrical stimulation and/or macroscopical recordings (large number of neurons or nerves). These probes can incorporate fiber optics and/or drug delivery cannula for precise optogenetic stimulation and local drug administration. We offer our electrodes in various designs for acute and long-term (chronic) applications.

# Key Features

Concentric Electrodes are ideal for precise bipolar stimulation (evoked activity or evoked potential studies) in acute or chronic experiments. The core electrode (Platinum/ Iridium or Stainless Steel) is sharpened to facilitate dura penetration and precise, localized stimulation of the tissue. We use polyimide tubing for insulating the outer Stainless Steel tube, which exposed part forms the other contact. Epoxy insulation separates the two metal contacts. The macroscopic tip has a tapering profile.

In case of the chronic design an epoxy blob, placed approximately 10mm away from the sharp electrode tip helps the implantation. Also, a Stainless Steel reinforcement rod, which helps in precision and which might be cut off post implantation, is attached to the probe.

Two gold male pin connectors provide easy connection to your data acquisition system.

Neurological recording and stimulation

Acute and chronic recordings in small to large animals

Moderately customizable design

Capillary and fiber options

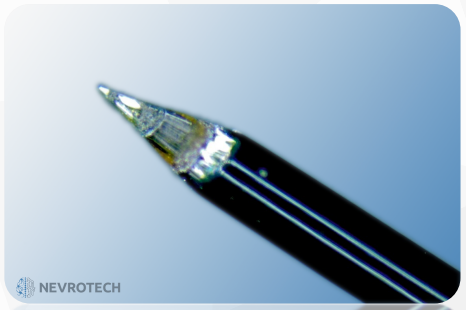
Dura puncture with the sharpened tip profile

Various connector options (gold pins as default)

# Specification

| | |
|---|---|
| **GENERAL** | |
| Ideal method of use | Acute and chronic |
| Application method | In vivo and in vitro |
| Research phase | Pre-clinical |
| Subject | Small-, mid- and large-sized animals, such as rodents, primates or brain slices |
| Shape | Symmetric |
| Linear/Stereotrode/Tetrode | - |
| **TIP** | |
| Angle (°) | 15, 30, 60 |
| Material | Epoxy, Platinum/Iridium (Stainless Steel) |
| Shape | Tapered |
| **SHAFT** | |
| Material | Stainless Steel (with polyimide tubing) |
| Diameter (µm) | 250 (185 + gap (25) + polyimide thickness (2x20)) |
| Length (mm) | 75, 125 (SS core) and 50 (Pt/It core) |
| Ferromagnetic | Y (non-MRI compatible) |
| **ELECTRODE SITES** | |
| Material | Platinum/Iridium or Stainless-Steel (core) and Stainless Steel (macro) |
| Diameter (µm) | 2-3 for Stainless Steel, 2-5 for Platinum/Iridium (core) and 185 for Stainless Steel (macro) |
| Length of exposed core (µm) | 200-300 (Stainless Steel) and 200-400 (Platinum/Iridium) |
| Number of electrode channels | 2 |
| Tip to 1st site distance (µm) / Inter-electrode spacing (µm) | - |
| Tip to epoxy blob distance (mm) | 10 |
| **CAPILLARY FLUID CHANNEL** | |
| Applicable | Y |
| Material | Glass, Polyimide |
| Outer diameter (µm) | As per user's request |
| Inner diameter (µm) | As per user's request |
| **FIBER OPTICS** | |
| Applicable | Y |
| Diameter (µm) | 75, 125 |
| **REINFORCEMENT TUBE** | |
| Applicable | Y |
| Diameter (µm) | As per user's request |
| Length (mm) | As per user's request (typical is 50) |
| **OTHER** | |
| Silicone disk | N |
| Connector types | Gold pins |
| Lifespan | Reusable |
| Silicone cable between connector and probe (cm) | Chronic only |
| Special notes | It is important to test the capillary/fiber optics before the first use. Frequent cleaning is also recommended. |

# Heptode Magic Pencil




## DESCRIPTION

The Heptode Magic Pencil significantly improves spike sorting precision compared to the traditional microelectrodes or tetrodes. This performance is driven by a high-performance spatial recording characteristics, which allows for a more accurate identification of neuronal spikes.

# Key Features

The thin, Stainless Steel shaft of the probe contains 7 Platinum/Iridium electrodes, from which the middle one (tip electrode) is symmetrically surrounded by the 6 others . The Heptode Magic Pencil is characterized by low impedance value and remarkable signal-to-noise ratio (SNR). It is ideal for pre-clinical recordings.

Due to its shape, the Heptode Magic Pencil has the benefit of easy dural penetration resulting in minimal tissue trauma. For larger animals, such as primates a guide tube may be recommended for puncture.

We can also build either capillaries (acute only) or fibers into the Heptode Magic Pencil for local drug delivery and optogenetical studies, respectively.

7 channels for single-unit or field potential recordings

Improved spike sorting performance

Easy dural penetration

Stable impedance

Excellent signal-to-noise ratio (SNR)

Acute and chronic recordings

Moderately customizable, durable

Capillary and fiber options

Various connector types available

# Specification

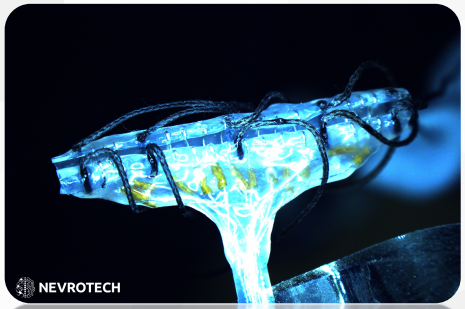
| | |
|---|---|
| **GENERAL** | |
| Ideal method of use | Acute and chronic |
| Application method | In vivo or in vitro |
| Research phase | Pre-clinical |
| Subject | Small-, mid- and large-sized animals, such as primates |
| Shape | Symmetric |
| Linear/Stereotrode | N |
| Tetrode | Y (heptode format is preferable) |
| Spacing if stereotrode or tetrode (μm) | - |
| **TIP** | |
| Angle (°) | 30, 60 |
| Material | Epoxy, Stainless Steel, Platinum/Iridium (recording tip electrode) |
| Shape | Tapered (conical or sharpened) |
| **SHAFT** | |
| Material | Stainless Steel |
| Diameter (μm) | 185 |
| Length (mm) | 10-200 (tip to the end of shaft) |
| Ferromagnetic | Y (non-MRI compatible) |
| **ELECTRODE SITES** | |
| Material | Platinum/Iridium (placed concentrically) |
| Diameter (μm) | 15, 20, 25, 40 |
| Inter-electrode spacing (μm) | 50 |
| Number of electrode channels | 7 |
| Tip to 1st site distance (μm) | - |
| **CAPILLARY FLUID CHANNEL** | |
| Applicable | Y (acute only) |
| Material | Glass |
| Outer diameter (μm) | 75 |
| Inner diameter (μm) | 50 |
| **FIBER OPTICS** | |
| Applicable | Y |
| Diameter (μm) | 75, 125 |
| **REINFORCEMENT TUBE** | |
| Applicable | Y |
| Diameter (μm) | 250-640 |
| Length (mm) | 10-200 |
| **OTHER** | |
| Silicone disk | N |
| Connector types | Omnetics, Precidip (as per user's request) |
| Lifespan | Reusable |
| Silicone cable between connector and probe (mm) | Chronic only |

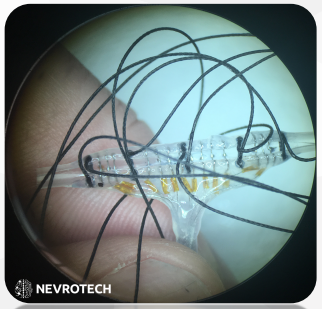
# 03

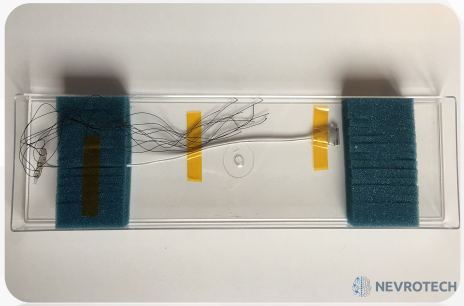
# PERIPHERAL ELECTRODES

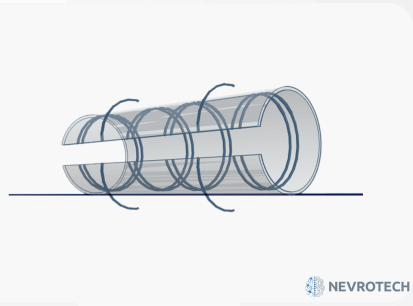
- Nerve Cuffs

# Nerve Cuffs




## DESCRIPTION

Cuff-type electrodes are specifically designed for recording and stimulating nerves in both acute and chronic pre-clinical settings.

Nerve Cuffs offer improved reliability, easier implantation and more control compared to the traditional hook-type electrodes. They eliminate issues related to recording stability and space availability, and significantly reduce experiment preparation time. Even though Nerve Cuffs are priori inferior to hook-type electrodes in terms of signal-to-noise ratio, they offer a less traumatic solution for acute and chronic experiments.

# Key Features

Nerve Cuffs are made of biocompatible and autoclavable materials. They are designed to provide flexibility in electrode contact location and material, number of contacts (two is minimum required), length, inner diameter, position and type of surgical sutures and other parameters to best fit the target nerve. Both micro and normal designs are available.

We provide the following geometric configurations: (i) Standard Nerve Cuffs with many custom combinations and sizes; (ii) Multi-bipolar Nerve Cuffs for achieving higher signal-to-noise ratios.

For acute experiments, we can also build either capillaries or fibers into the cuff for local drug delivery and optogenetical studies, respectively.

Neurological recording and stimulation

Acute and chronic experiments

Highly customizable design

Various cuff and electrode materials available

Configurations with up to 32 contacts

Capillaries and fibers for acute studies

Rodent, feline, bird and primate research

# Specification

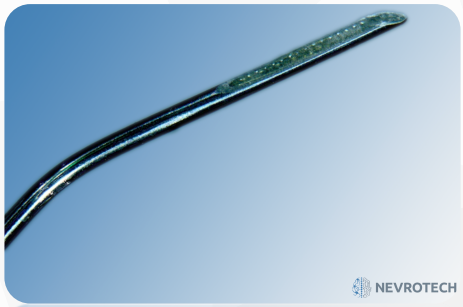
| | |
|---|---|
| **GENERAL** | |
| Ideal method of use | Acute and chronic |
| Application method | In vivo |
| Research phase | Pre-clinical |
| Subject | Rodent, feline, birds and primates |
| **CUFF** | |
| Material | Silicone |
| Inner diameter (mm, micro) | 0.5-1 |
| Inner diameter (mm, normal) | 1-10 |
| Length (mm) | Custom (subject to the number of contacts) |
| Ferromagnetic | N |
| **ELECTRODE RING CONTACTS** | |
| Material and thickness (μm, micro) | 50-100 (Platinum/Iridium) |
| Material and thickness (μm, normal) | 100-150 or 250 (Platinum/Iridium) or 125 (Stranded Stainless Steel) |
| Number of contacts | 2-32 |
| Inter-contact spacing (mm) | Custom |
| Spacing between group of contacts (mm) | Custom |
| Distance from the last contact to the end of the cuff | Usually 3x the space between contacts |
| **OTHER** | |
| Connector types | Omnetics, Precidip (as per user's request) |
| Lifespan | Reusable |
| Length of output lead (mm) | Min. 40 (suggested is 300) |
| Material of output lead | Teflon insulated multi-strand stainless steel |
| Surgical suture threads | Sterilized (optional) |
| Capillary fluid channel | Y (acute only) |
| Fiber optics | Y (acute only) |

# 04

# MULTICHANNEL ARRAYS

- Brain Slice Multielectrode Arrays
- Deep Brain Probes
- Strengthened Microwire Arrays
- Chronic Laminar Probes
- Microwire Arrays
- Thumbtack Multielectrode Arrays

# Brain Slice Multielectrode Arrays




## DESCRIPTION

Brain Slice Multielectrode Arrays have multiple recording sites in a configuration up to 32 electrode channels. These probes are bended at 45° to effectively record the neural activity from the surface of a brain slice.

Such probes have an exceptionally durable structure that is also highly customizable. Brain Slice Multielectrode Arrays are available in linear, stereotrode or tetrode configurations and they are built into a stainless steel tube to provide support for accurate acute research.

# Key Features

The recording sites are placed on the bottom side of a Stainless Steel, "hockey stick" cone with a choice of 4, 8, 16, 24 or 32 electrode channels in a length up to 200mm. These Platinum/Iridium recording sites are available in 15, 20, 25 and 40µm diameter options. The smallest diameter of 15µm allows effective single-unit recording, and complemented with low impedance such probes have a better signal-to-noise ratio (SNR). Larger diameter probes are more suitable for field potential recordings.

We can also build either capillaries or fibers into the Brain Slice Multielectrode Arrays for local drug delivery and optogenetical studies, respectively. The capillary fluid channel may need to be placed between the recording electrodes. Note that the minimum diameter of the probe may need to increase to accommodate these capabilities.

Highly robust and reusable stainless steel construction

Single, stereotrode or tetrode configurations available

Acute recordings on brain slices

Highly customizable design

Platinum/Iridium sites (4-32 channels)

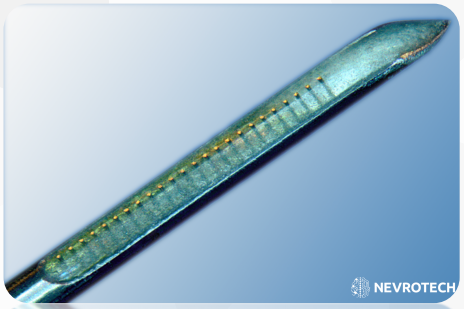
Capillaries and fibers available

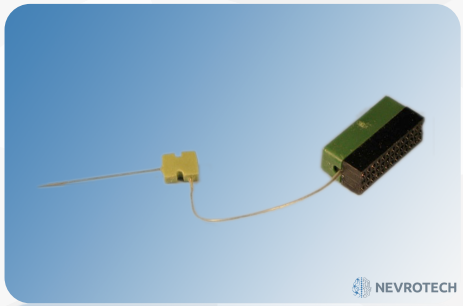
Various connector types available

# Specification

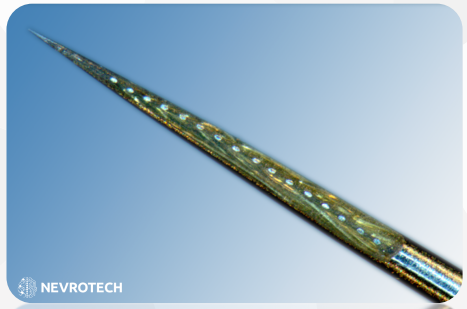
| | |
|---|---|
| **GENERAL** | |
| Ideal method of use | Acute |
| Application method | In vitro |
| Research phase | Pre-clinical |
| Subject | Brain slices |
| Shape | Hockey Stick (electrodes are placed on the bottom side) |
| Linear/Stereotrode/Tetrode | Y |
| Spacing if stereotrode or tetrode (μm) | Min. 50 |
| **TIP** | |
| Angle (°) | 30, 60 |
| Material | Epoxy, Stainless Steel |
| Shape | Tapered (sharpened) |
| **SHAFT** | |
| Material | Stainless Steel |
| Diameter (μm) | 185-360 (varies based on the number of electrodes and the use of capillaries and fibers) |
| Length (mm) | 10-200 (tip to the end of shaft) |
| Ferromagnetic | Y (non-MRI compatible) |
| **ELECTRODE SITES** | |
| Material | Platinum/Iridium |
| Diameter (μm) | 15, 20, 25, 40 |
| Inter-electrode spacing (μm) | 50-500 (100 is typical) |
| Number of electrode channels | 4, 8, 16, 24, 32 |
| Tip to 1st site distance (μm) | Min. 200 |
| **CAPILLARY FLUID CHANNEL** | |
| Applicable | Y |
| Material | Glass |
| Outer diameter (μm) | 75 |
| Inner diameter (μm) | 50 |
| **FIBRE OPTICS** | |
| Applicable | Y |
| Diameter (μm) | 75, 125 |
| **OTHER** | |
| Reinforcement tube | N |
| Silicone disk | N |
| Connector types | Omnetics, Precidip (as per user's request) |
| Lifespan | Reusable |
| Silicone cable between connector and probe (mm) | - |
| Special notes | It is important to test the capillary/fiber optics before the first use. Frequent cleaning is also recommended. |

# Chronic Laminar Probes








## DESCRIPTION

Chronic Laminar Probes have multiple recording sites in a configuration up to 32 electrode channels. They come with either a conical or sharpened tip, from which the latter has the benefit of easy dural penetration.

These probes are designed for chronic application in medium to large subjects, such as primates and they are available in linear, stereotrode or tetrode configurations. Chronic Laminar Probes have an exceptionally durable structure that is also highly customizable.

# Key Features

The recording sites are placed on the side of a symmetric, stainless steel/epoxy cone with a choice of 4, 8, 16, 24 or 32 electrode channels in a length up to 150mm. These Platinum/Iridium recording sites are available in 15, 20, 25 and 40µm diameter options. The smallest diameter of 15µm allows effective single-unit recording, and complemented with low impedance such probes have a better signal-to-noise ratio (SNR). Larger diameter probes are more suitable for field potential recordings.

The silicone output lead connects the probe to the connector, which flexibility allows the movement of the probe into different positions while in use. The connecting part between the probe and the silicone cable is araldite-type epoxy resin. Chronic Laminar Probes allow either superficial or deep brain penetration.

Highly robust and reusable stainless steel/epoxy construction

Single, stereotrode or tetrode configurations available

Chronic recordings in medium to large animals

Highly customizable design

Conical tip to minimize trauma

Dura puncture

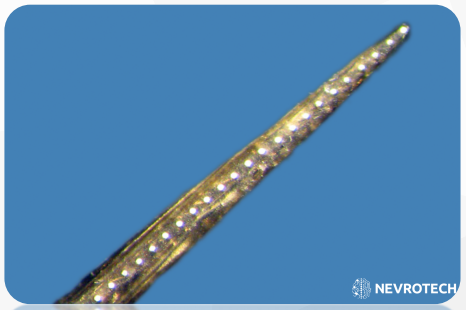
Platinum/Iridium sites (4-32 channels)

Various connector types available

# Specification

| | |
|---|---|
| **GENERAL** | |
| Ideal method of use | Chronic |
| Application method | In vivo |
| Research phase | Pre-clinical |
| Subject | Mid- and large-sized animals, such as primates |
| Shape | Conical, symmetric probe |
| Linear/Stereotrode/Tetrode | Y |
| Spacing if stereotrode or tetrode (μm) | Min. 50 |
| **TIP** | |
| Angle (°) | 15, 30, 60 |
| Material | Epoxy, (Stainless Steel) |
| Shape | Tapered (conical or sharpened) |
| **SHAFT** | |
| Material | Stainless Steel |
| Diameter (μm) | 185-360 (varies based on the number of electrodes) |
| Length (mm) | 10-150 (tip to the end of shaft) |
| Ferromagnetic | Y (non-MRI compatible) |
| **ELECTRODE SITES** | |
| Material | Platinum/Iridium |
| Diameter (μm) | 15, 20, 25, 40 |
| Inter-electrode spacing (μm) | 50-500 (100 is typical) |
| Number of electrode channels | 4, 8, 16, 24, 32 |
| Tip to 1st site distance (μm) | 500-800 (combination of tip angle and probe diameter) |
| **OTHER** | |
| Capillary fluid channel | N |
| Fibre optics | N |
| Reinforcement tube | N |
| Silicone disk | N |
| Connector types | Omnetics, Precidip (as per user's request) |
| Lifespan | Recording from 1 subject |
| Silicone cable between connector and probe (mm) | 10-200 |

# Deep Brain Probes





## DESCRIPTION

Deep Brain Probes have multiple recording sites in a configuration up to 32 electrode channels. They come with either a conical or sharpened tip, from which the latter has the benefit of easy dural penetration. It could be integrated into a Stainless Steel guide tube, which may offer an easier and more precise implantation.

# Key Features

Deep Brain Probes are designed for acute application in medium to large subjects, such as primates and they are available in linear, stereotrode or tetrode configurations. Deep Brain Probes have a durable structure that is also highly customizable. They allow either superficial or deep brain penetration.

The recording sites are placed on the side of a symmetric, epoxy cone with a choice of 4, 8, 16, 24 or 32 electrode channels in a length up to 150mm. These Platinum/Iridium recording sites are available in 15, 20, 25 and 40µm diameter options. The smallest diameter of 15µm allows effective single-unit recording, and complemented with low impedance such probes have a better signal-to-noise ratio (SNR). Larger diameter probes are more suitable for field potential recordings. Epoxy filled polyimide tubing acts as a lead, which connects the recording array to the connector.

Robust epoxy construction

Single, stereotrode or tetrode configurations available

Acute and chronic recordings in medium to large animals

Highly customizable design

Tapered tip to minimize trauma

Dura puncture

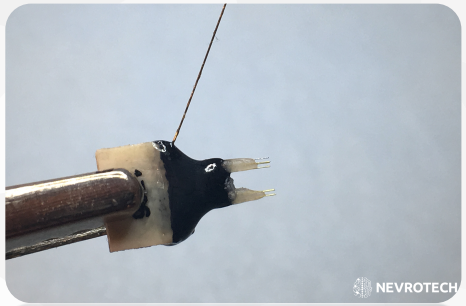
Platinum/Iridium sites (4-32 channels)

Various connector types available

# Specification

| | |
|---|---|
| **GENERAL** | |
| Ideal method of use | Acute and chronic |
| Application method | In vivo |
| Research phase | Pre-clinical |
| Subject | Mid- and large-sized animals, such as primates |
| Shape | Conical, symmetric probe |
| Linear/Stereotrode/Tetrode | Y |
| Spacing if stereotrode or tetrode (μm) | Min. 50 |
| **TIP** | |
| Angle (°) | 15, 30, 60 |
| Material | Epoxy, (Polyimide) |
| Shape | Tapered (conical or sharpened) |
| **SHAFT** | |
| Material | Epoxy, Polyimide |
| Diameter (μm) | 185-360 (varies based on the number of electrodes) |
| Length (mm) | 10-150 (tip to the connector) |
| Ferromagnetic | N |
| **ELECTRODE SITES** | |
| Material | Platinum/Iridium |
| Diameter (μm) | 15, 20, 25, 40 |
| Inter-electrode spacing (μm) | 50-500 (100 is typical) |
| Number of electrode channels | 4, 8, 16, 24, 32 |
| Tip to 1st site distance (μm) | 100-300 (combination of tip angle and probe diameter) |
| **REINFORCEMENT TUBE** | |
| Applicable | Y |
| Diameter (μm) | As per user's request |
| Length (mm) | As per user's request |
| **OTHER** | |
| Capillary fluid channel | N |
| Fibre optics | N |
| Silicone disk | N |
| Connector types | Omnetics, Precidip (as per user's request) |
| Lifespan | Recording from 1 subject (chronic) |
| Silicone cable between connector and probe (mm) | - |

# Microwire Arrays



## DESCRIPTION

Microwire Arrays are designed for both short- and long-term neural recordings in rodent, feline, bird and primate research.

Their recording reliability stems from a sound construction, which is also highly customizable. Tailoring options include: number of electrodes and rows, length and spacing, insulation and connectors, among others.

# Key Features

The Stainless Steel or Platinum/Iridium wires are individually cut to length and Polyethylene Glycol (PEG) ensures the stable arrangement of the wires while advanced into the target tissue. PEG may be easily washed-off with saline during the insertion process. Such approach allows to researcher for effective deep brain penetration.

Microwire Arrays are really made to your specification. They can also incorporate fiber optics and/or drug delivery cannula for precise optogenetic stimulation and local drug administration. It may also be possible to produce these probes beyond the listed parameters to accommodate the most ideal configuration for your research needs.

Primarily used for chronic recordings

Rodent, feline, bird and primate research

Custom reference and ground electrodes

Highly customizable design

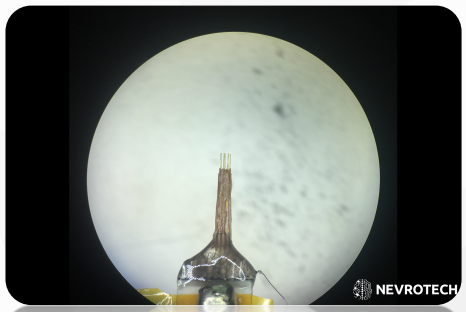
Capillary and fiber options

Up to 64 wires and 6 connectors

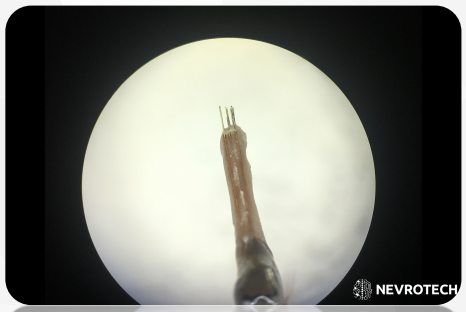
# Specification

| | |
|---|---|
| **GENERAL** | |
| Ideal method of use | Acute and chronic |
| Application method | In vivo |
| Research phase | Pre-clinical |
| Subject | Rodent, feline, birds and primates |
| **ELECTRODE WIRES** | |
| Tip angle (°) | Not tapered (cut end) |
| Material | Stainless Steel, Platinum/Iridium |
| Insulation | Polyimide, Teflon |
| Diameter (μm) | 25, 50, 75 |
| Number of electrodes | 4-64 |
| Number of rows | 1-12 |
| Inter-electrode spacing (μm) | 150-2000 |
| Inter-row spacing (μm) | 150-2000 |
| Electrode configurations | 1x2, 2x3, 4x4, 2x8, 4x8, etc. |
| Impedance (kΩ) | 50-1000 (per wire) |
| Epoxy blob | Optional |
| Security of arrangement | PEG |
| Wire length (mm) | 5-23 (different length for each wire may be possible) |
| Epoxy length below connector (mm) | 2-6 |
| Wire length covered with PEG (mm) | 1-23 (5 is typical) |
| Wire length exposed beyond PEG | 1-10 (2 is typical) |
| Ferromagnetic | Y (non-MRI compatible) |
| **OTHER** | |
| Ground wire | Optional (Stainless Steel, typically positioned at the base of the connector) |
| Ground wire length (mm) | Up to 150 |
| Reference wire | Optional (material as for the electrode wires) |
| Capillary fluid channel | Y (acute only) |
| Fibre optics | Y (acute only) |
| Connector types | Omnetics |
| Number of connectors | 1-6 |
| Lifespan | Recording from 1 subject (chronic) |

# Strengthened Microwire Arrays








## DESCRIPTION

Microwire Arrays are designed for both short- and long-term neural recordings in rodent, feline, bird and primate research.

Their recording reliability stems from a sound construction, which is also highly customizable. Tailoring options include: number of electrodes and rows, length and spacing, insulation and connectors, among others.

# Key Features

The Stainless Steel or Platinum/Iridium wires are individually cut to length and Polyethylene Glycol (PEG) ensures the stable arrangement of the wires while advanced into the target tissue. PEG may be easily washed-off with saline during the insertion process. Such approach allows to researcher for effective deep brain penetration. We offer Polyimide, Borosilicate and Fused Silica capillaries for mechanically strengthening the individual electrodes of the Microwire Array for accessing deeper brain structures.

Microwire Arrays are really made to your specification. They can also incorporate fiber optics and/or drug delivery cannula for precise optogenetic stimulation and local drug administration. It may also be possible to produce these probes beyond the listed parameters to accommodate the most ideal configuration for your research needs.

Primarily used for chronic recordings

Rodent, feline, bird and primate research

Custom reference and ground electrodes

Highly customizable design

Strengthened structure for deep brain penetration

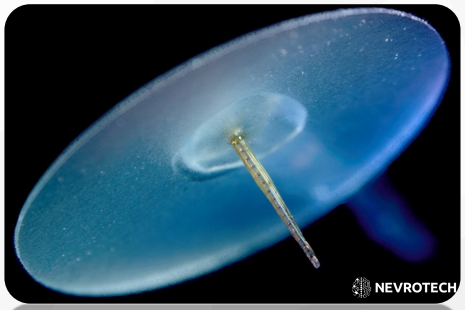
Capillary and fiber options

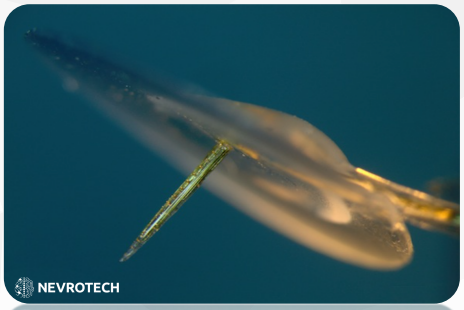
Up to 64 wires and 6 connectors

# Specification

| | |
|---|---|
| **GENERAL** | |
| Ideal method of use | Acute and chronic |
| Application method | In vivo |
| Research phase | Pre-clinical |
| Subject | Rodent, feline, birds and primates |
| **ELECTRODE WIRES** | |
| Tip angle (°) | Not tapered (cut end) |
| Material | Stainless Steel, Platinum/Iridium |
| Insulation | Polyimide, Teflon |
| Diameter (μm) | 25, 50, 75 |
| Number of electrodes | 4-64 |
| Number of rows | 1-12 |
| Inter-electrode spacing (μm) | 150-2000 |
| Inter-row spacing (μm) | 150-2000 |
| Electrode configurations | 1x2, 2x3, 4x4, 2x8, 4x8, etc. |
| Impedance (kΩ) | 50-1000 (per wire) |
| Epoxy blob | Optional |
| Security of arrangement | PEG, Polyimide, Borosilicate and Fused Silica capillaries |
| Wire length (mm) | 5-23 (different length for each wire may be possible) |
| Epoxy length below connector (mm) | 2-6 |
| Wire length covered with PEG (mm) | 1-23 (5 is typical) |
| Wire length exposed beyond PEG | 1-10 (2 is typical) |
| Ferromagnetic | Y (non-MRI compatible) |
| **OTHER** | |
| Ground wire | Optional (Stainless Steel, typically positioned at the base of the connector) |
| Ground wire length (mm) | Up to 150 |
| Reference wire | Optional (material as for the electrode wires) |
| Capillary fluid channel | Y (acute only) |
| Fibre optics | Y (acute only) |
| Connector types | Omnetics |
| Number of connectors | 1-6 |
| Lifespan | Recording from 1 subject (chronic) |

# Thumbtack Multielectrode Arrays




## DESCRIPTION

Thumbtack Multielectrode Arrays have multiple recording sites in a configuration up to 32 electrode channels. They are designed to record electroencephalogram (EEG) signals from all layers of the cortex in parallel in vivo, and used in chronic applications in medium to large subjects, such as primates.

# Key Features

Thumbtack Multielectrode Arrays come with either a conical or sharpened tip to minimize trauma upon penetration. The recording sites are placed on the side of a symmetric epoxy cone with a choice of 4, 8, 16, 24 or 32 electrode channels with a maximum diameter of 500µm.

These Platinum/Iridium recording sites are available in 15, 20, 25 and 40µm diameter options. The smallest diameter of 15µm allows effective single-unit recording, and complemented with low impedance such probes have a better signal-to-noise ratio (SNR). Larger diameter probes are more suitable for field potential recordings.

In support of securing the Multielectrode Array in position and setting the depth of insertion, a very thin, round silicone disk is added perpendicularly to the end of the probe. Also, a silicone output lead with an integrated silk thread connects the probe to the connector.

Chronic recordings in medium to large animals

Effective to record intra-cortical EEG signals

Highly customizable design

Conical tip to minimize trauma

Platinum/Iridium sites (4-32 channels)

Silicone disk to set the depth of insertion and to hold the TMA in place

Various connector types available

# Specification

| | |
|---|---|
| **GENERAL** | |
| Ideal method of use | Chronic |
| Application method | In vivo |
| Research phase | Pre-clinical |
| Subject | Mid- and large-sized animals, such as primates |
| Shape | Asymmetric (tapering probe profile with silicone disk on top) |
| Linear | Y |
| Stereotrode | N |
| Tetrode | Y |
| Spacing if stereotrode or tetrode (μm) | Min. 50 |
| **TIP** | |
| Angle (°) | 15, 30, 60 |
| Material | Epoxy |
| Shape | Tapered (conical or sharpened) |
| **SHAFT** | |
| Material | Epoxy |
| Diameter (μm) | 200-500 (varies based on the number of electrodes) |
| Length (mm) | 10-150 (tip to the end of shaft) |
| Ferromagnetic | N |
| **ELECTRODE SITES** | |
| Material | Platinum/Iridium |
| Diameter (μm) | 15, 20, 25, 40 |
| Inter-electrode spacing (μm) | 50-500 (100 is typical) |
| Number of electrode channels | 4, 8, 16, 24, 32 |
| Tip to 1st site distance (μm) | 100-300 (combination of tip angle and probe diameter) |
| **SILICONE DISK** | |
| Silicone disk | Y |
| Diameter (mm) | Min. 8 |
| Thickness (mm) | 0.15 |
| **OTHER** | |
| Capillary fluid channel | N |
| Fibre optics | N |
| Reinforcement tube | N |
| Connector types | Omnetics, Precidip (as per user's request) |
| Lifespan | Recording from 1 subject |
| Silicone cable between connector and probe (mm) | 15-300 |


# NEVROTECH

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January 2018

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