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## Novel Planar Microelectrodes With Unique Morphological Structure For Enhanced Neural Recording

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### Background

Researchers at the University of Calgary have designed and fabricated planar microelectrodes that allow non-invasive recording of neuronal activities over an extended time period, and at a resolution (Figure 1) up to 15 times higher than any similar commercially available devices. The chip also allows non-invasive stimulation of neural cells embedded in an ensemble or when cultured individually. These microelectrodes fill a gap in the market, as they can record neural activity at a much higher resolution than traditional planar electrodes, while still maintaining the ability to perform long-term recording for up to several weeks (Figure 2) without compromising cellular viability.

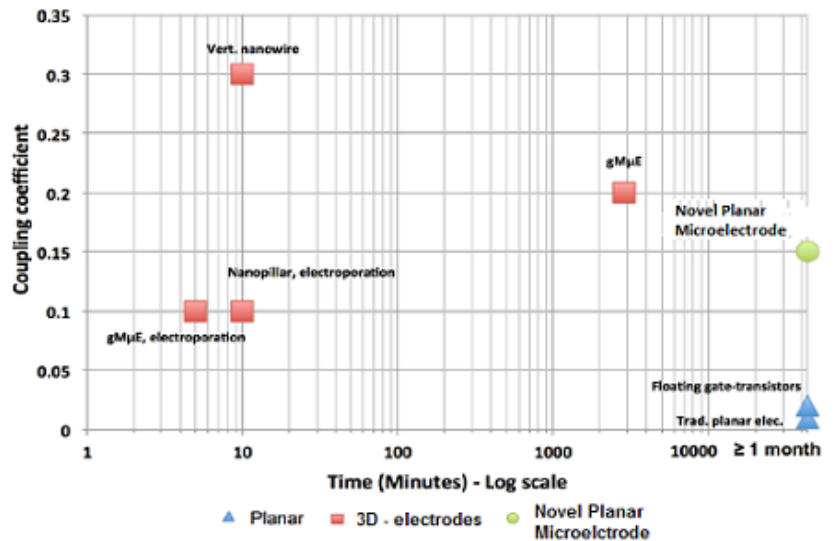
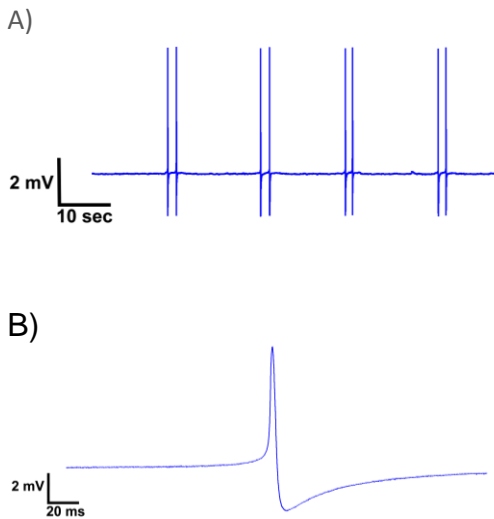


Figure 1. Resolution of recorded action potential (mV). A) Patterned bursts of action potentials; B) Single action potential with increased temporal resolution.

Figure 2. Neural recording using novel planar microelectrodes and comparison with existing devices



## Technology Advantages

- Non-invasive
- High coupling coefficient
- High sealing resistance
- High signal-to-noise ratio
- High resolution, up to 15 times higher than similar devices
- Recording over an extended period of time (several weeks to months)
- Low cost and highly customizable

## Stage of Development

- Prototype was fabricated using standard techniques and the design is fully customizable
- This technology has been tested *in vitro*, can also be used *in vivo*
- This technology is now commonly used to conduct novel biological experiments both in developing and matured networks of neurons and also to test various compounds.

## Intellectual Property Status

- Patent Pending