Research in the Tatic-Lucic Group

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Professor
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LEHIGH UNIVERSITY | **Department of Bioengineering**

Svetlana Tatic-Lucic

- **Professor, Bioengineering &Electrical and Computer Engineering, Lehigh University**

- **Education and Training**
  - Ph.D., Electrical Engineering, California Institute of Technology, Pasadena CA
  - M.S., Electrical Engineering, California Institute of Technology, Pasadena, CA
 - B.S., Electrical Engineering, University of Belgrade, Serbia

- **Research Areas**
  - Applications of MEMS in cell biology and neuroscience, microfabrication, microsensors and microactuators, sensor reliability and packaging

- **Sample Publications**

  o Zhou, T., Ming, Y., Perry, S.F. and Tatic-Lucic, S. 2016 "Estimation of the Physical Properties of Neurons and Glial Cells Using Dielectrophoresis Crossover Frequency," Journal of Biological Physics, Volume 42, Issue 4, pp. 571-586

  o Zhou, T., Perry, S.F., Ming. S, Petryna, S., Fluck, V. and Tatic-Lucic, S. 2015. "Separation and Assisted Patterning of Hippocampal Neurons from Glial Cells Using Positive Dielectrophoresis", Biomedical Microdevices, Volume 17, Issue 3, Article number 62

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Multielectrode Arrays for Patterned Neuronal Networks
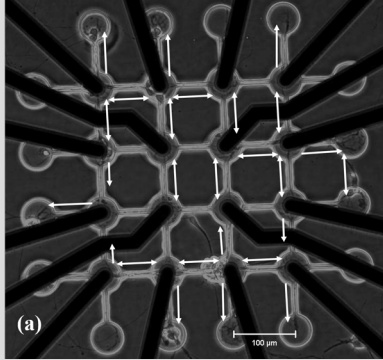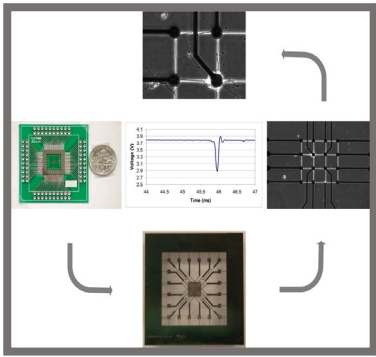
- **What are the aims?**

To develop a multi-electrode array (MEA) which will enable stimulation and recording from neuronal networks with pre-defined position of neuronal bodies and neuronal processes

- **Why is this topic significant?**

This MEA is a unique platform that enables biologists and medical researchers investigate topics and phenomena for which they did not have appropriate tools before

- **How is the topic studied?**

This research requires broad knowledge base in microfabrication, electrical circuits and cell culturing. These MEAs can be used:

- In neuroscience for investigating the processes of thought and memory
- In sensing applications (to detect neuroactive compounds)
- In pharmacological studies

- **What are the future directions of this research?**

Developing a highly reliable and repeatable platform suitable for various types of neurons

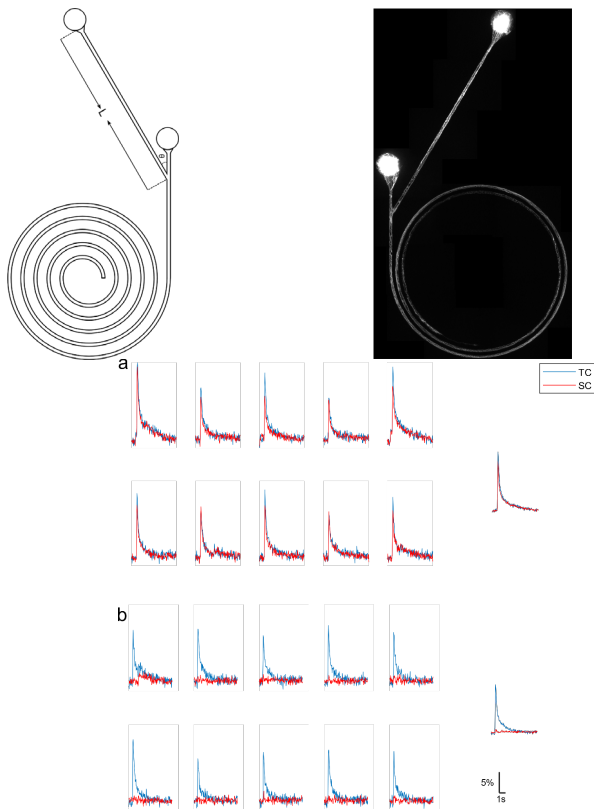LEHIGH UNIVERSITY | **Department of Bioengineering**
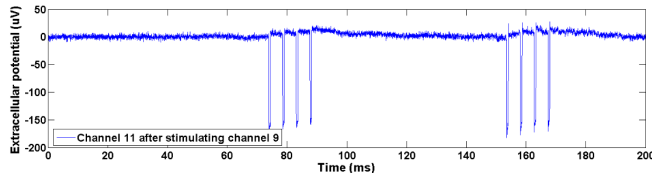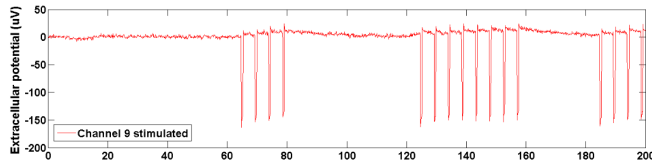
Micromachined Systems for Mechanical Characterization of Biological Cells
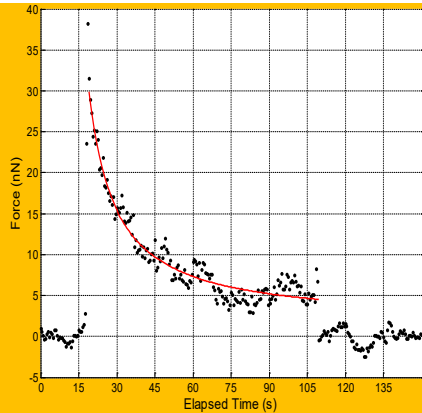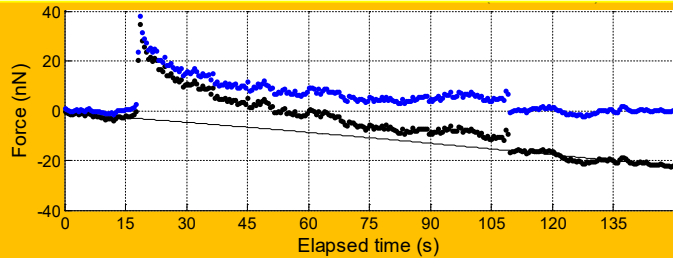
- **What is the aims?**
  - To develop a platform for mechanical characterization of individual cells

- **Why is this topic significant?**
  -Clinical diagnosis
  -Tissue engineering and regenerative medicine

- **What are the target Diseases?**
  - Osteoporosis

- **What are the future directions of this research?**

  Manufacturing reliable platform that is easy to use and suitable for cells of different types and sizes.

- **What are the aims?**

  To develop micromachined PDMS-based platforms which will enable creation of directional neuronal circuits that more closely mimic conditions and functions of *in vivo* environment

- **Why is this topic significant?**

  Biologists and medical researchers are lacking good quality tools to understand better the nervous system and understand underpinnings of various mental diseases and disorders

- **What are the future directions of this research?**

  Developing a highly reliable and repeatable flexible platform suitable for different types and sizes of neuronal populations

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Contact

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