

# GABA Detection with Nano-ITIES Pipette Electrodes

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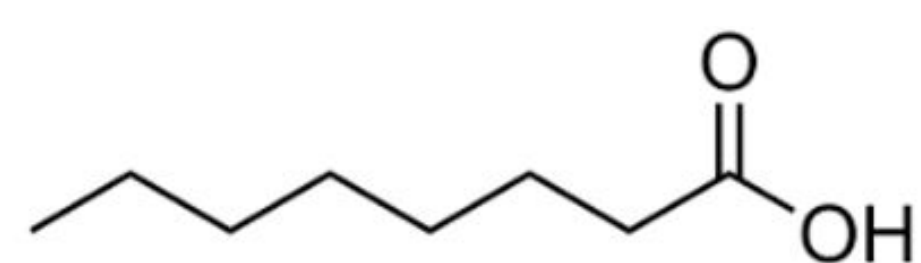
Shen Group

## OBJECTIVE

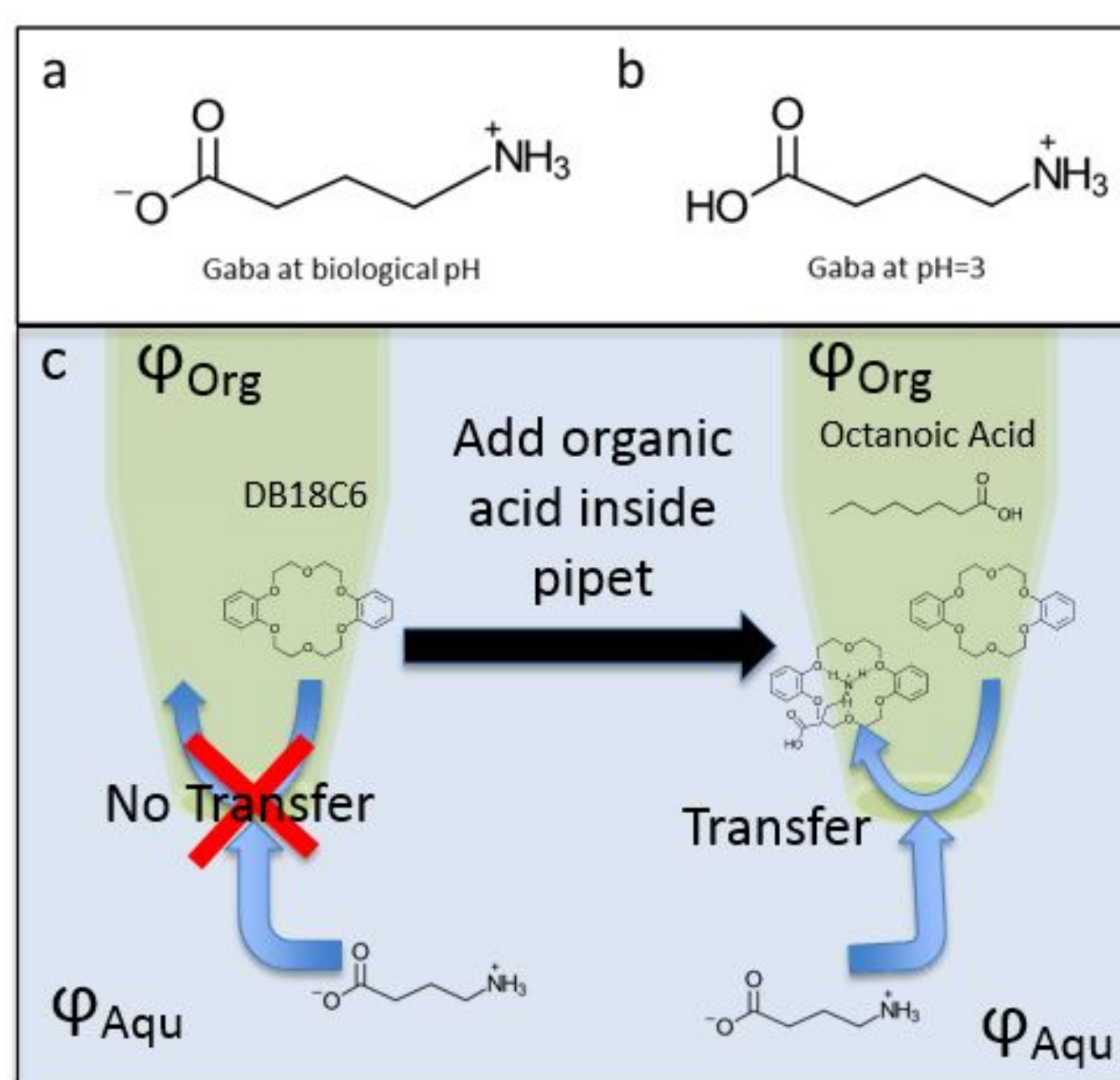
Detect GABA at the interface between two immiscible electrolyte solutions

## BACKGROUND

- Electrochemically redox inactive GABA cannot be directly detected with a carbon electrode
- Need to be protonated via an organic acid (octanoic acid)

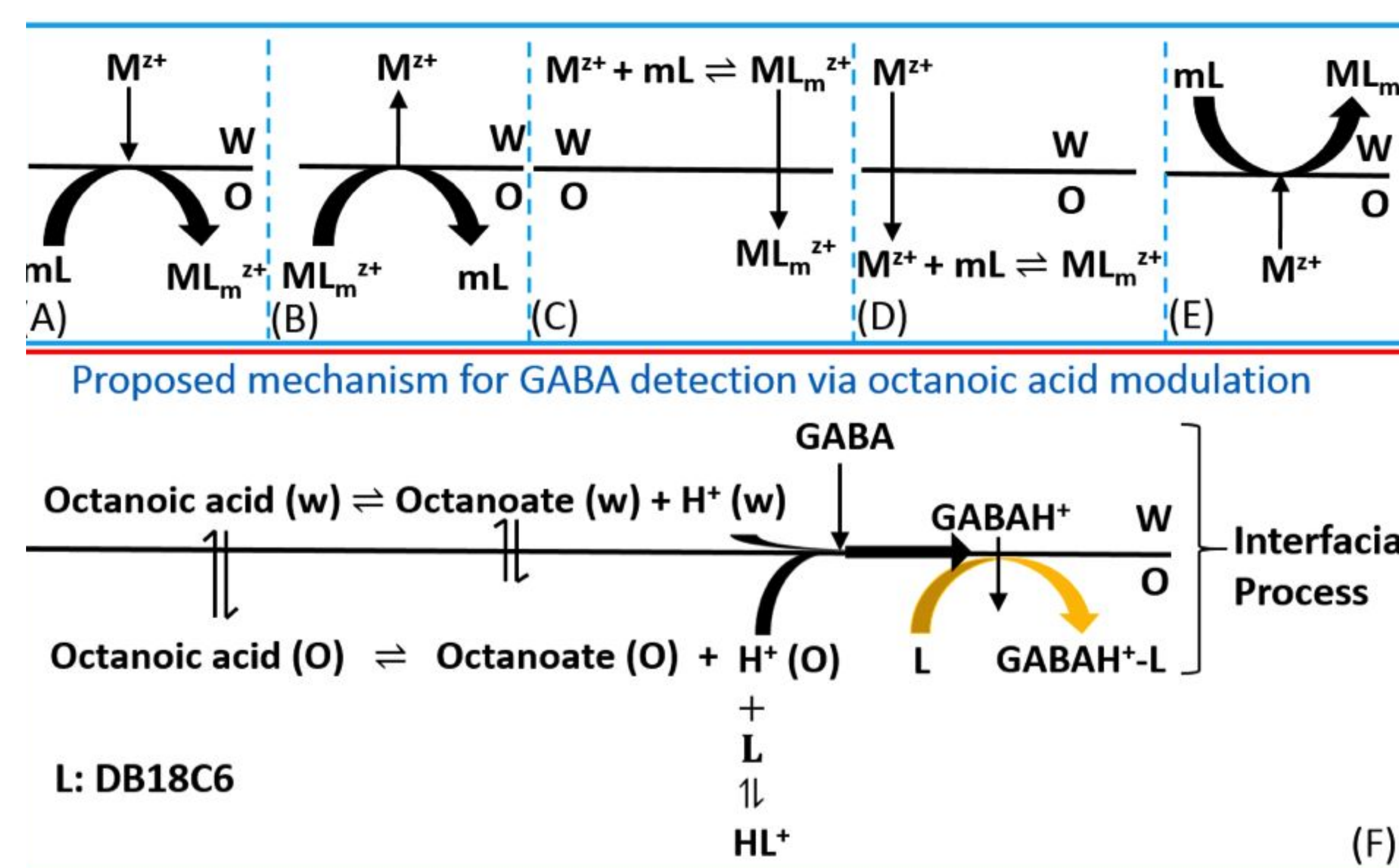


Octanoic acid:  
pH modulator from the oil phase



## CONCLUSION

- Octanoic acid in the filling solution protonated GABA
- Protonated GABA complexes with ionophore DB18C6



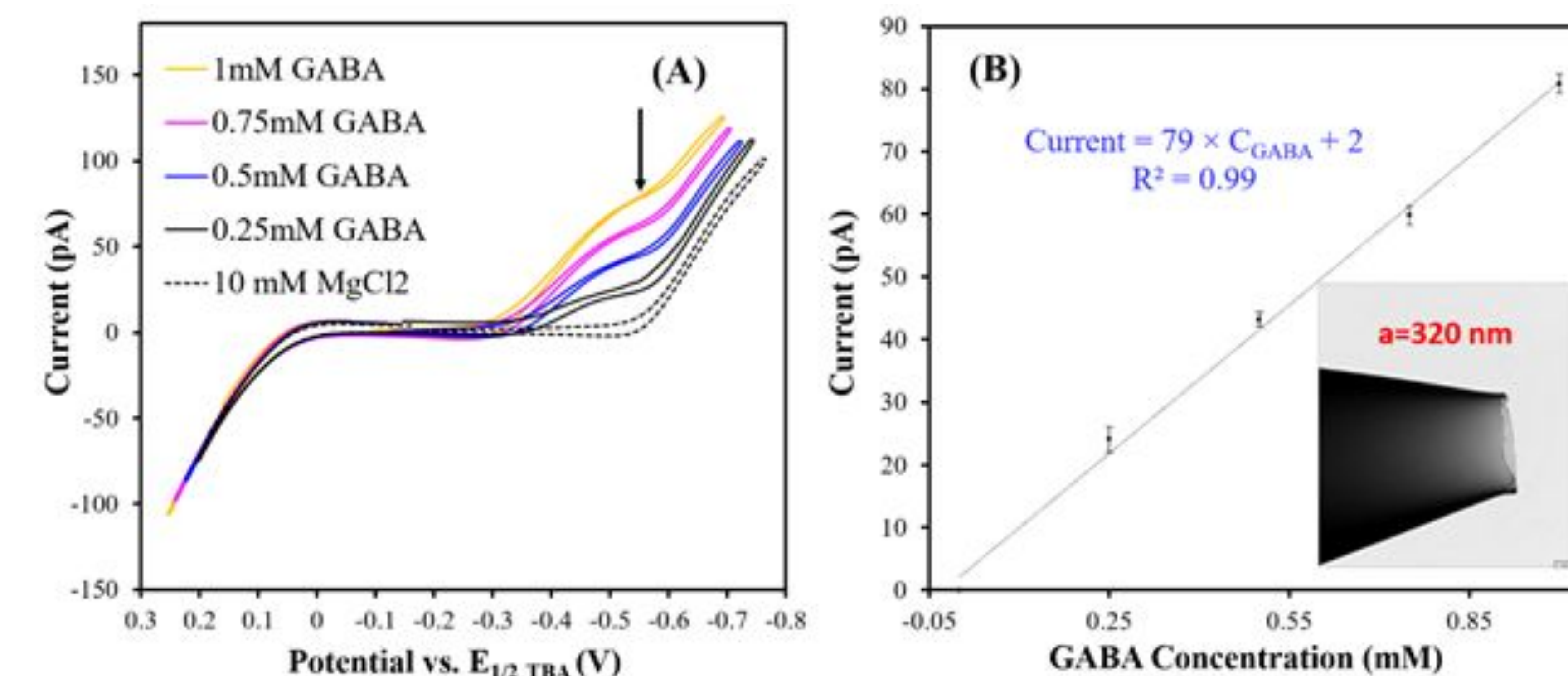
## FUTURE WORK

Currently, we are focusing on detecting GABA and betaine via the same method and testing various other organic acids such as cinnamic acid, trans-aconitic acid, and isophthalic acid.

## RESULTS

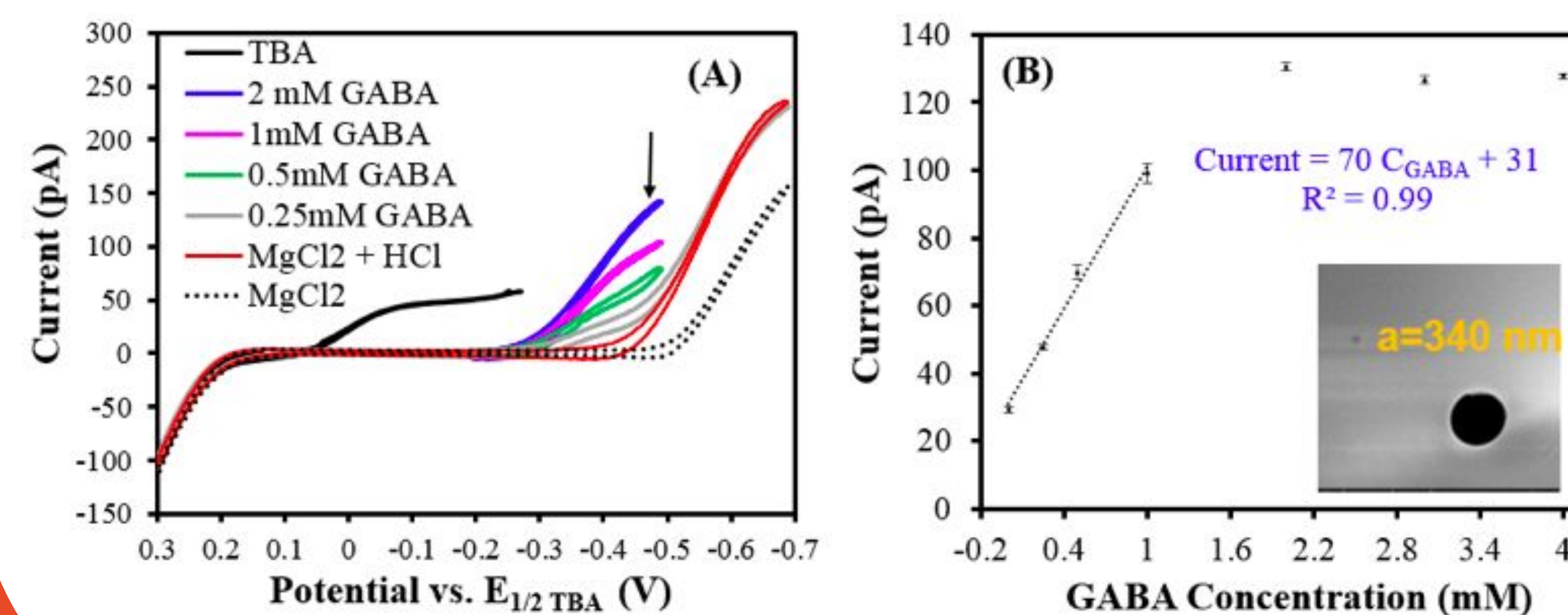
### GABA detection with nanoITIES pipet electrodes at physiological pH: transfer at water / DCE-octanoic acid interface

Cell: Pt | 25 mM DB18C6 + 5 mM TDDATFAB + 1, 2-DCE + 252 mM Octanoic acid (pH=2.75) || 10 mM MgCl<sub>2</sub> + X mM GABA (pH ≈ 7) | AgCl | Ag



### GABA transfer at water-HCl / 1, 2-DCE interface.

Cell: Pt | 25 mM DB18C6 + 5 mM TDDATFAB + 1, 2-DCE || 10 mM MgCl<sub>2</sub> + X mM GABA + Y mM HCl | AgCl | Ag



## ACKNOWLEDGEMENT

SEM was carried out in the Frederick Seitz Materials Research Laboratory Central Research Facilities, University of Illinois. We appreciate the funding support from National Institute Neurological Disorder and Stroke of National Institute of Health for the research.

## REFERENCE

GABA Detection with Nano-ITIES Pipet Electrode: A New Mechanism, Water/DCE-Octanoic Acid Interface. Nicholas Toshio Iwai, Michelle Kramaric, Daniel Crabbe, Yuanyuan Wei, Ran Chen, Mei Shen\*. Analytical Chemistry, 90, 3067-3072. (2018)