

# Excitability of meningeal trigeminal nerve afferents in DAT-HET (heterozygous dopamine transporter knock out) rats

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## INTRODUCTION

**Migraine** is widespread disorder characterized by severe headaches.

**Migraine can be** accompanied with dopaminergic symptoms (drowsiness, nausea, fatigue, mood changes).

**Trigeminal-vascular system (TVS)** is the key structure in generating pain signals in headaches.

**TVS consists of nociceptive fibers** originated from the trigeminal ganglion innervating dural vessels.

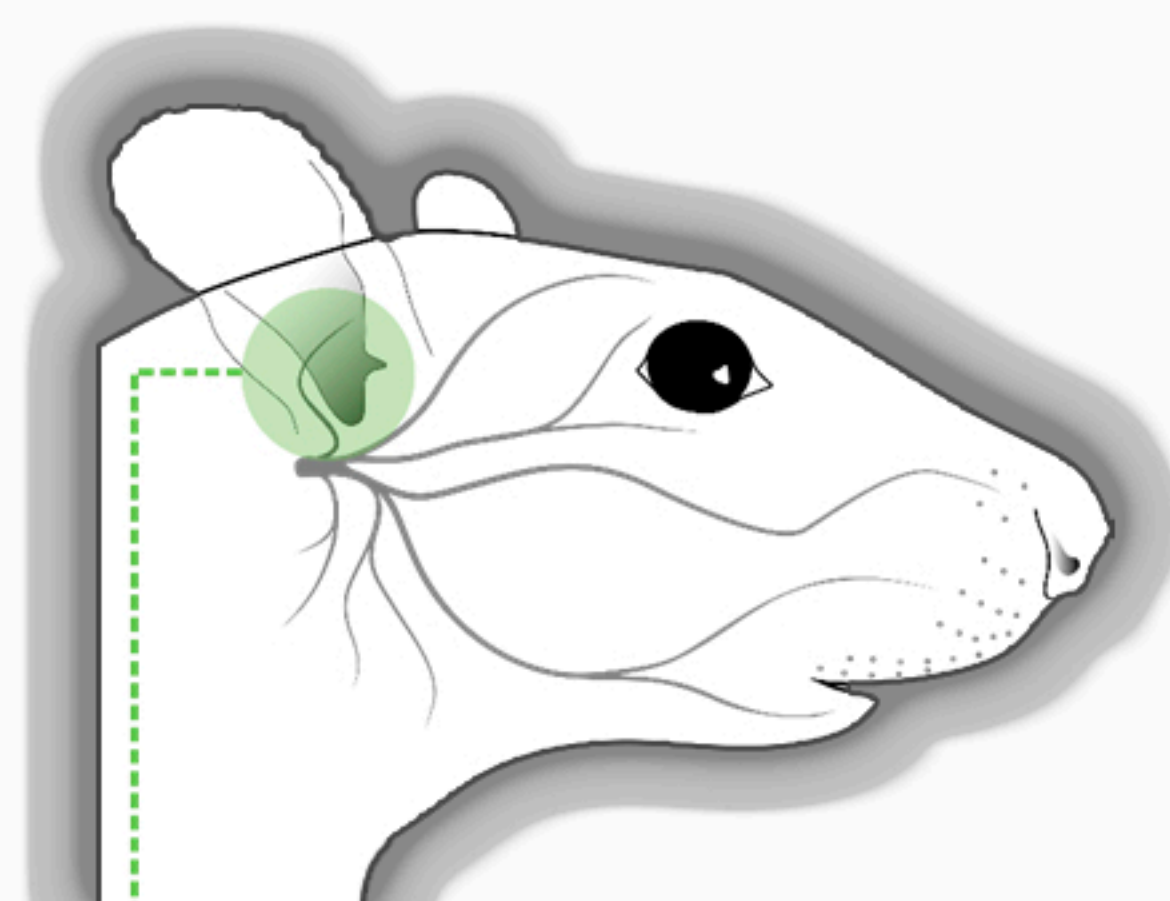
**Role of dopaminergic signaling** in TVS remains unclear.

**DAT-KO (dopamine transporter knock out)** and **DAT-HET** (heterozygous from DAT-KO) rats are recent models for studying dopaminergic disorders.

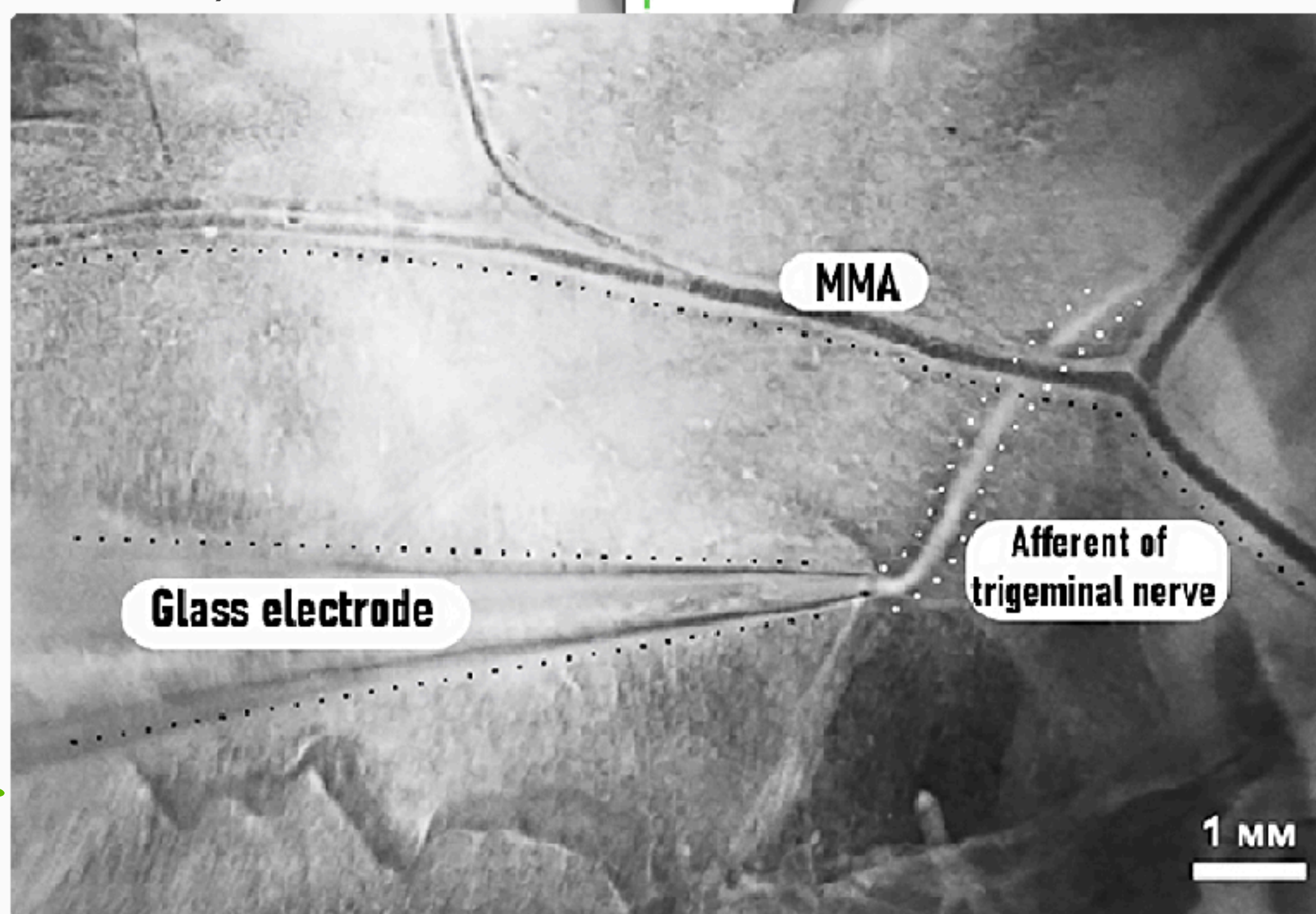
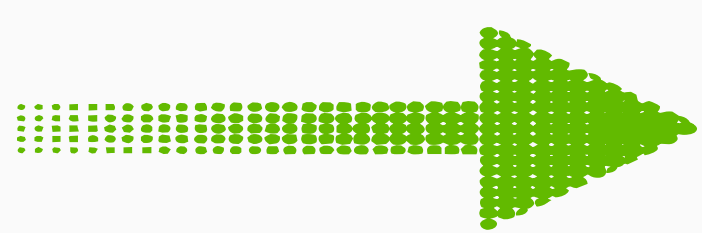
## METHODS

**Electrophysiological recording of APs (Action potentials)** in trigeminal afferents of dura mater

(Koroleva et al, 2023)



hemi-scul preparation

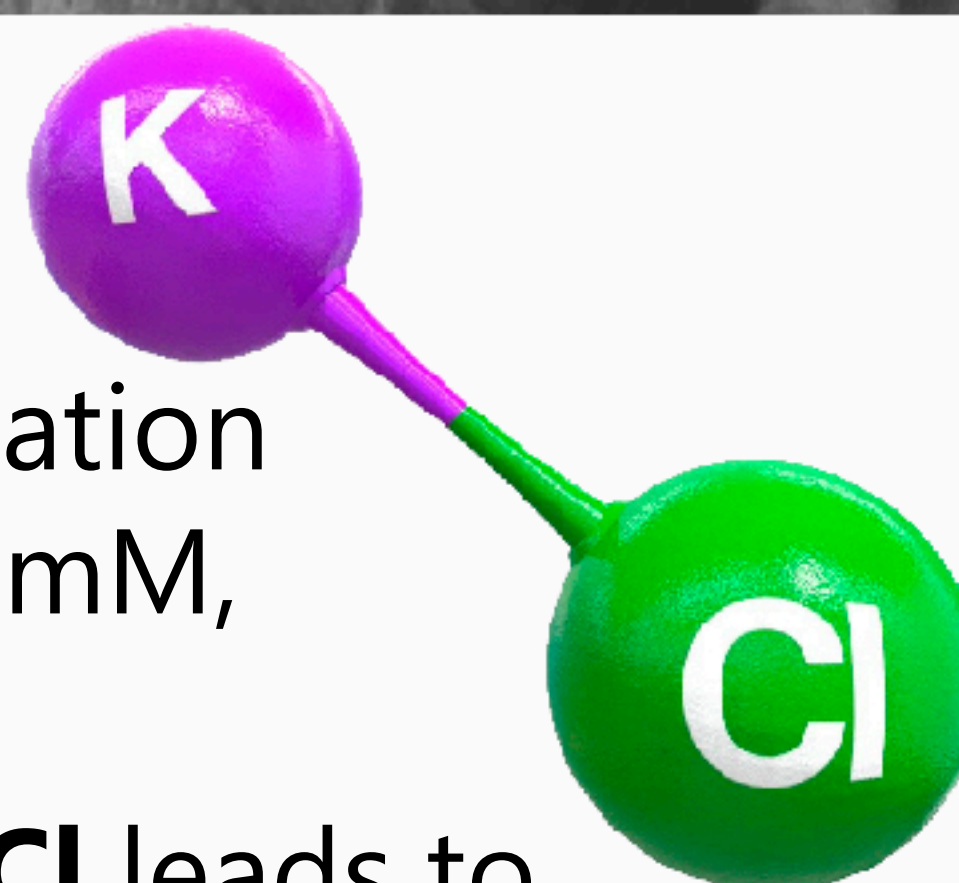
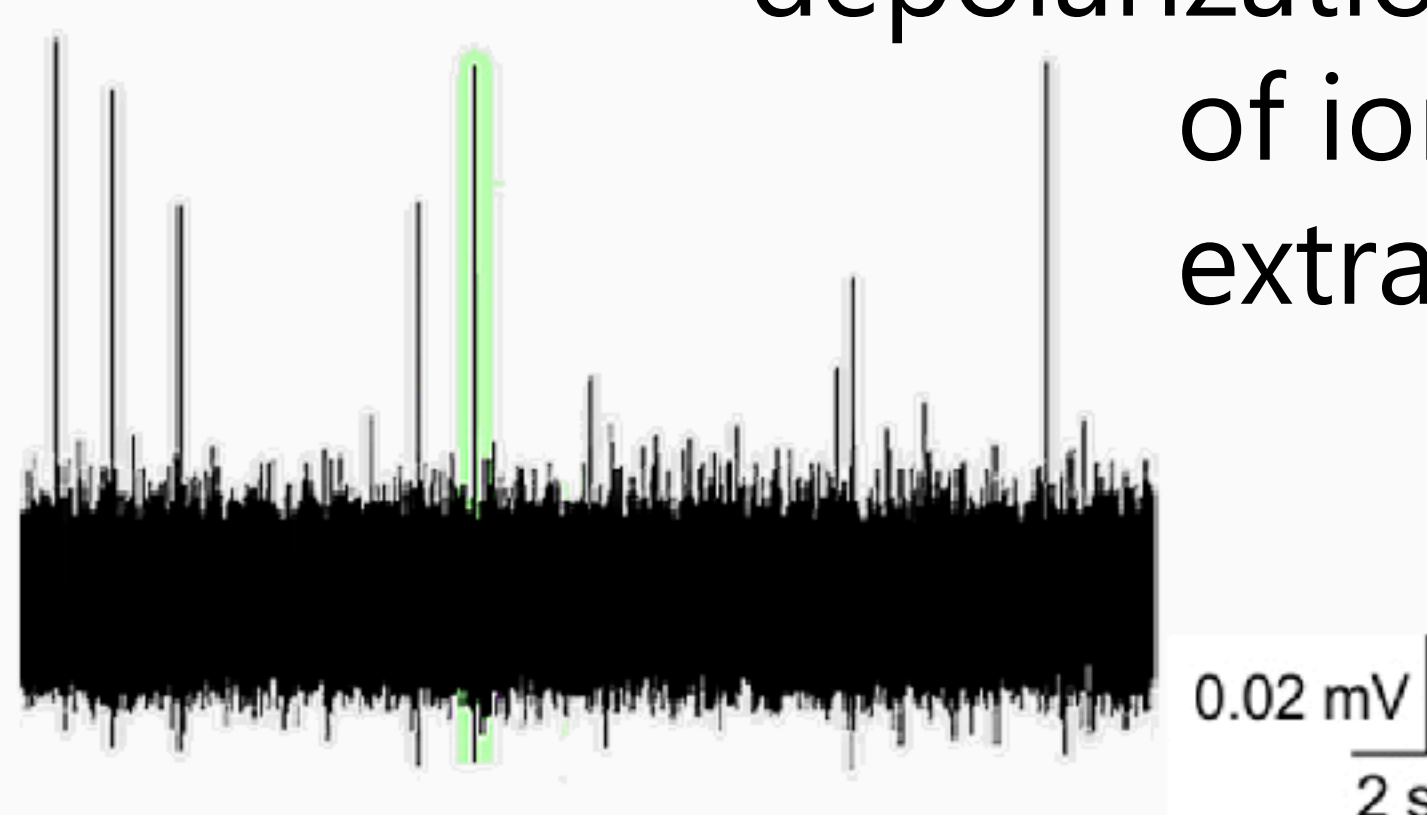


**Excitability was evaluated** with

cumulative application of KCl (5 mM, 10 mM, 25 mM, 50 mM)

**Application of KCl** leads to depolarization due to disturbance of ionic balance between extra- and intracellular spaces

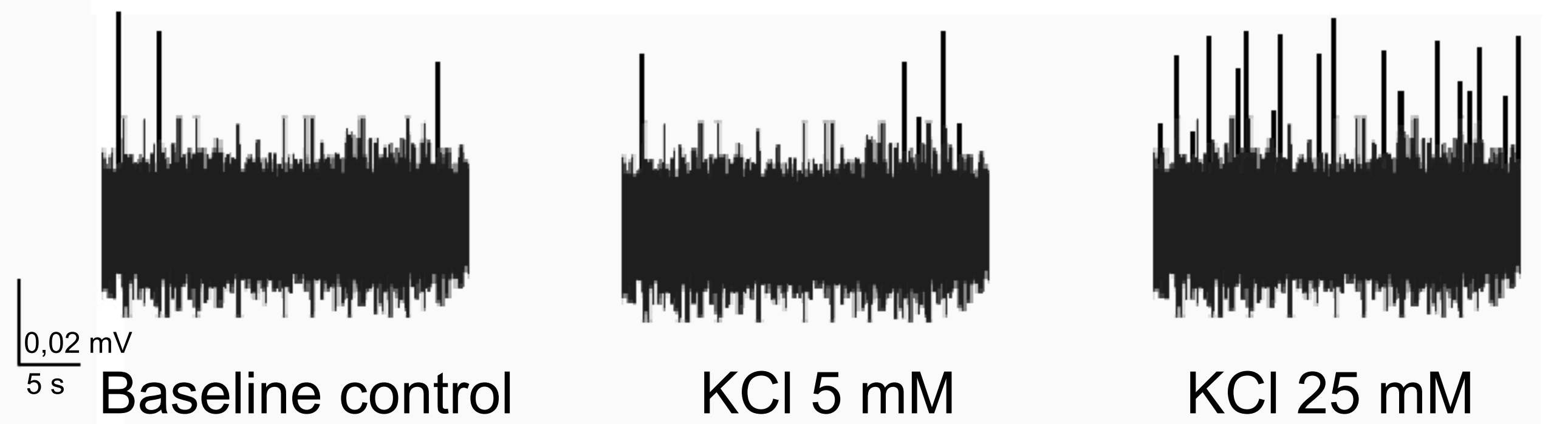
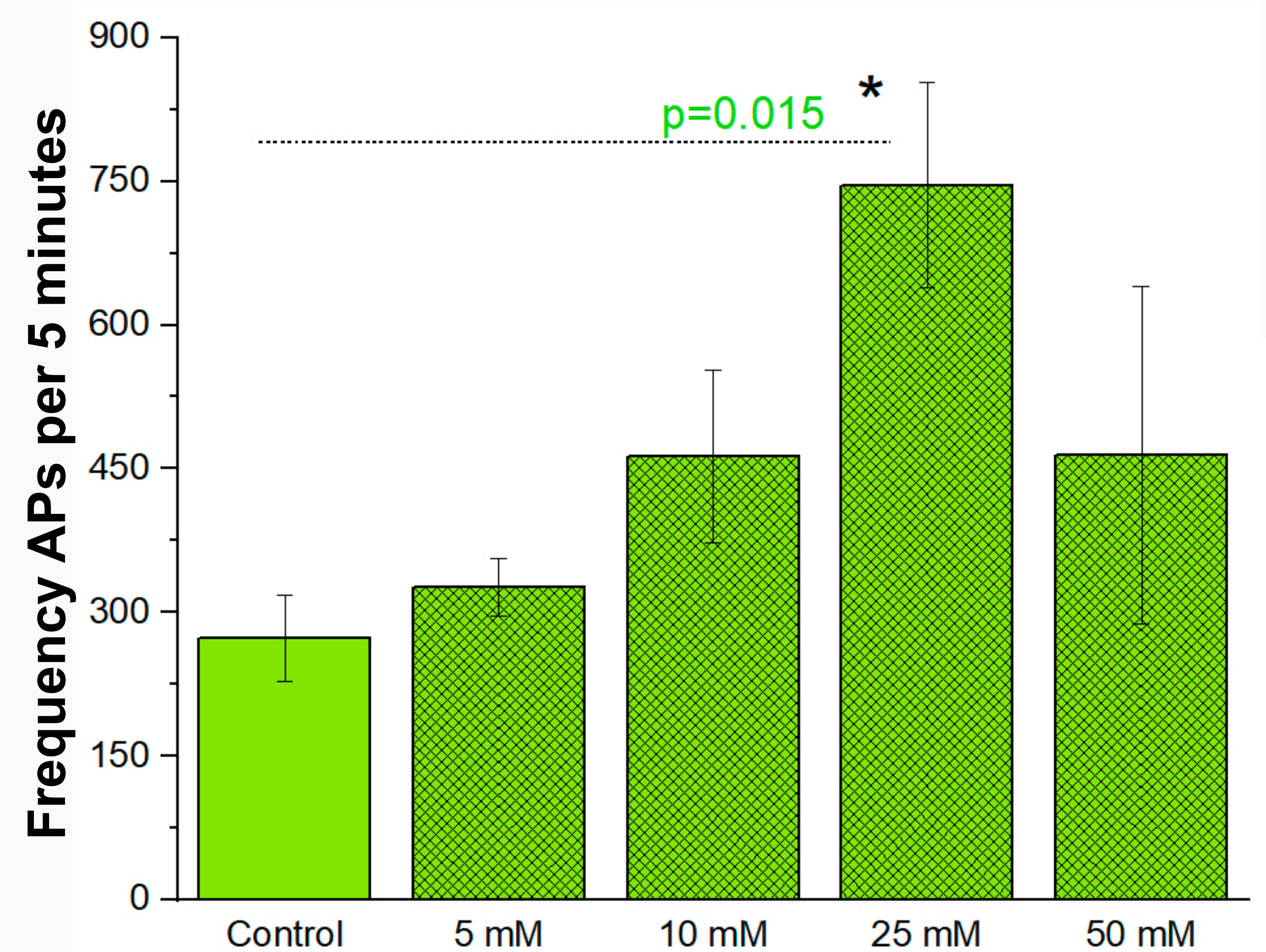
example of original trace of APs recording



## RESULTS

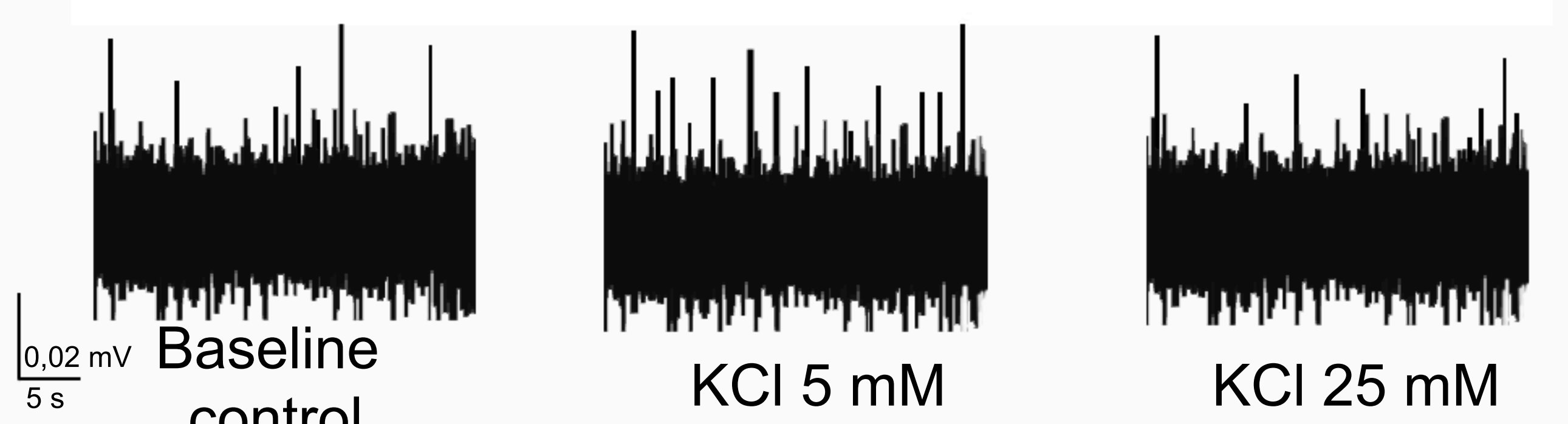
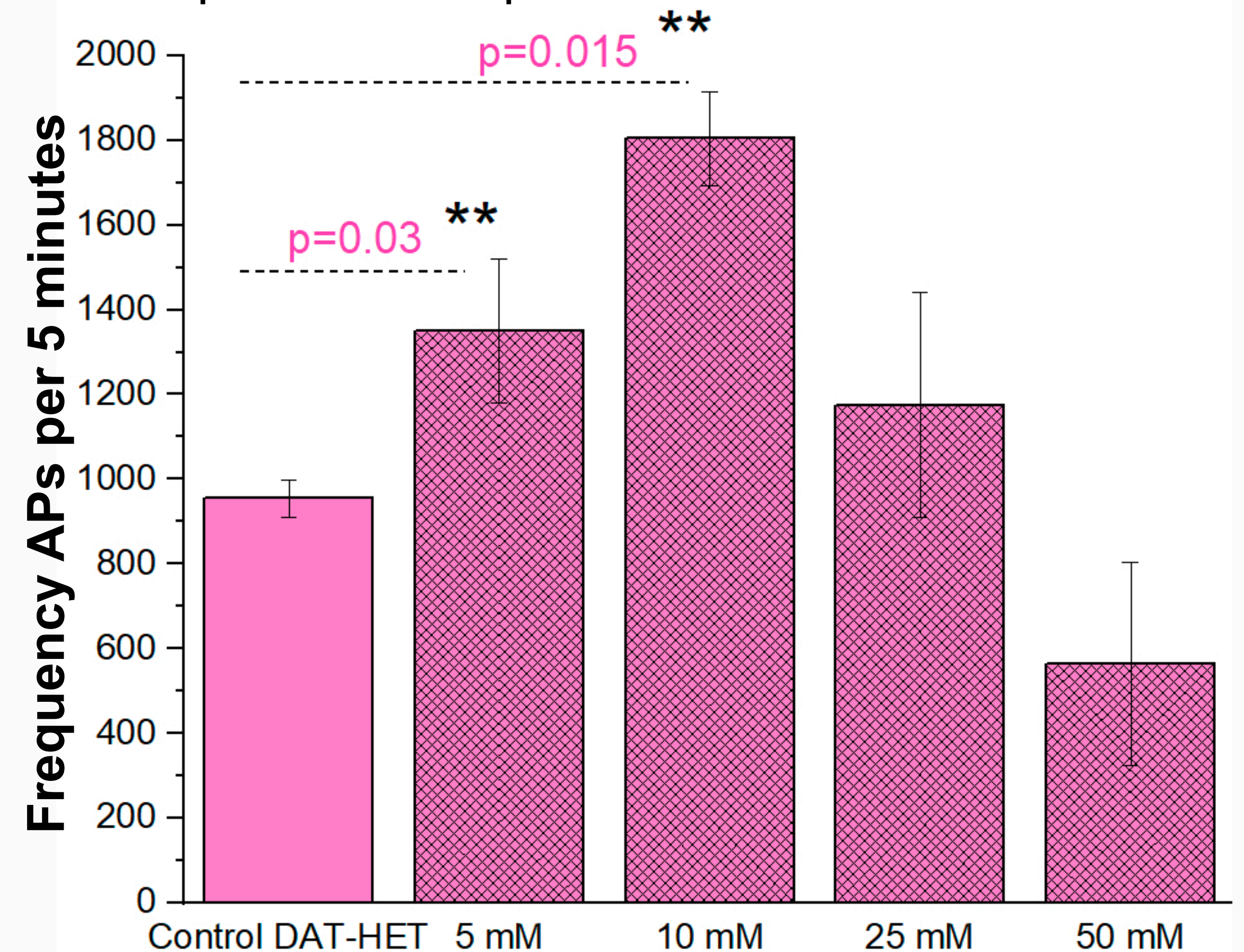
### 1. Application of KCl in concentration of 25 mM enhances AP rate in WT (wild type) group

\*p<0.05 compared to control rate; n=8



### 2. Lowest concentration of KCl (5 mM) leads to the increasing of AP rate in DAT-HET group

\*\*p<0.05 compared to control rate; n=7



**Conclusion:** The TG nerve afferents of rats from the DAT-HET group exhibited increased sensitivity to KCl application, indicating higher excitability.