

# Electrophysiological effects of cisplatin on $Na_v1.7$ currents in lung cancer cells

Serife Yerlikaya<sup>1</sup>, Damian C Bell<sup>2</sup>, Kim Boddum<sup>2</sup> and William J Brackenbury<sup>3,4</sup>

<sup>1</sup>Istanbul Medipol University, Research Institute for Health Sciences and Technologies (SABITA), Istanbul, Turkey; <sup>2</sup>Sophion Bioscience, DK-2750 Ballerup, Denmark; <sup>3</sup>Department of Biology, University of York, York, United Kingdom; <sup>4</sup>York Biomedical Research Institute, University of York, York, United Kingdom

## BACKGROUND

The VGSC subtype  $Na_v1.7$  is up-regulated in lung cancer cells, where it enhances invasion and metastasis. Platinum-based treatments, like cisplatin, can become less effective over time as the body develops a resistance to them, leading to a reduced response and increased difficulty in managing cancer. In addition to chemoresistance and reduced efficacy, cisplatin has been linked to chemotherapy-induced peripheral neuropathy that might explain associated chronic pain side-effects.

## AIM

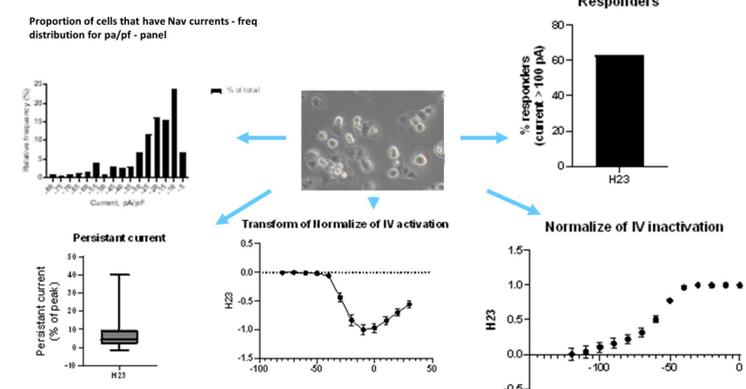
To show the electrophysiological effects of cisplatin on  $Na_v1.7$  currents in lung cancer cells (H23 cells) via the Qube 384 automated patch clamp (APC) platform.



## METHODS

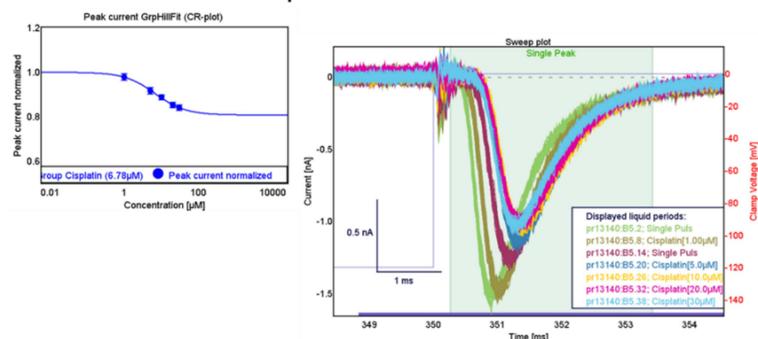
Experiments were conducted using the Qube 384 automated electrophysiology platform (Sophion Bioscience). This platform uses 384-well patch chips, each with 10 parallel patch holes per recording well. The diameter of each patch hole is approximately 1  $\mu m$ , with resistance between  $2.00 \pm 0.02 M\Omega$ .

## Proportion of H23 cells that have $Na^+$ currents

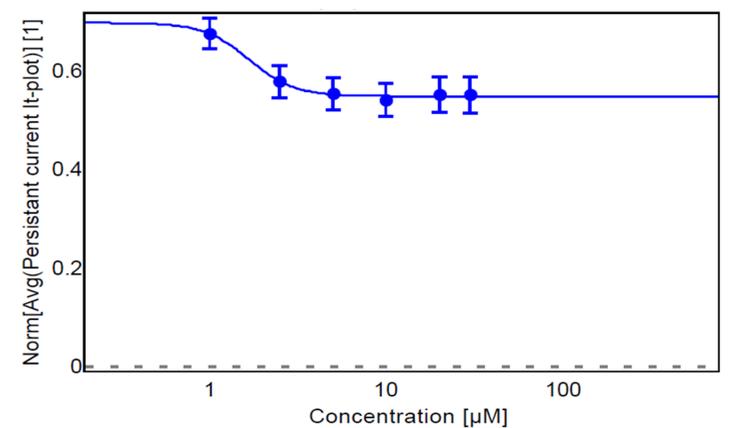


## Effect of cisplatin on peak $Na^+$ current

### Concentration-response of Norm Peak Current

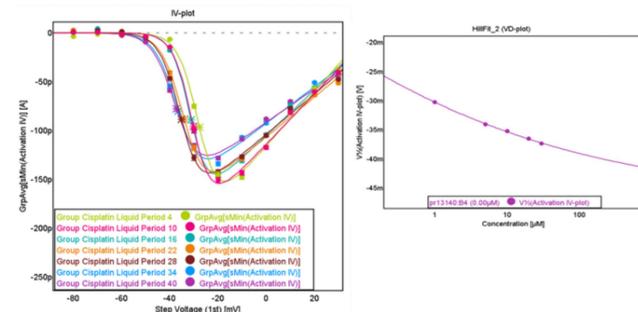


## Effects of cisplatin on persistent $Na^+$ current



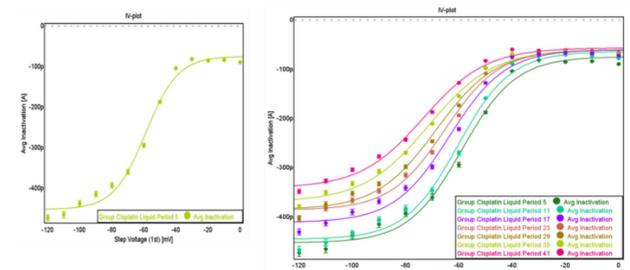
## Effect of cisplatin on voltage dependence of activation

### IV Plot Activation



## Effect of cisplatin on voltage dependence of inactivation

### IV Plot Inactivation



## CONCLUSIONS

- ✓ Six different concentrations of cisplatin (1, 2.5, 5, 10, 20 and 30  $\mu M$ ) were assessed using Sophion's Qube 384 APC on  $Na_v1.7$  currents in H23 lung cancer cells.
- ✓ Both peak and persistent currents showed a concentration-dependent decrease.
- ✓ Cisplatin reduces the voltage dependence of activation and inactivation in H23 cells.

## References

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