



# ENHANCING FUNCTIONAL RECOVERY WITH LOCAL FK506 HYDROGEL TREATMENT IN PERIPHERAL NERVE INJURY

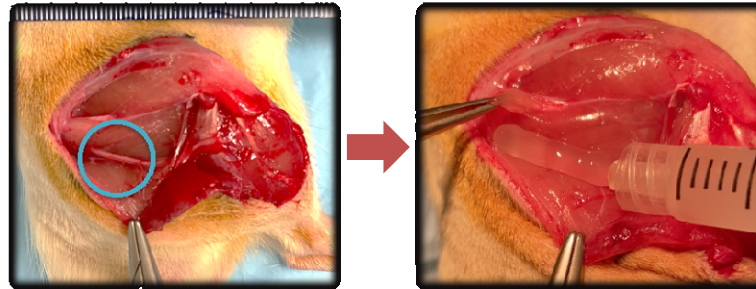
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## INTRODUCTION

- Nerve injuries result in **loss of function** with prolonged recovery.
- **FK506 (tacrolimus)** was found to have neurotrophic properties.
- However, **systemic side effects** limit its clinical applications.
- Aim: To assess **functional recovery** after systemic and local FK506 therapy with hydrogel following sciatic nerve injury on a rat model.

## METHODS



- **Sciatic nerve transection and repair surgery** was performed in all.
- Groups were followed up to **7 weeks** with weekly FK506 blood level measurements and **walking track/gait analysis**.
- **Gastrocnemius tetanic force** was assessed at the endpoint.

### Control

No additional treatment

### Systemic Injection

Daily subcutaneous injections of 2mg/kg FK506

### Empty Hydrogel

0.2mL/1.5cm of hydrogel over the repair site

### FK506 Loaded Hydrogel

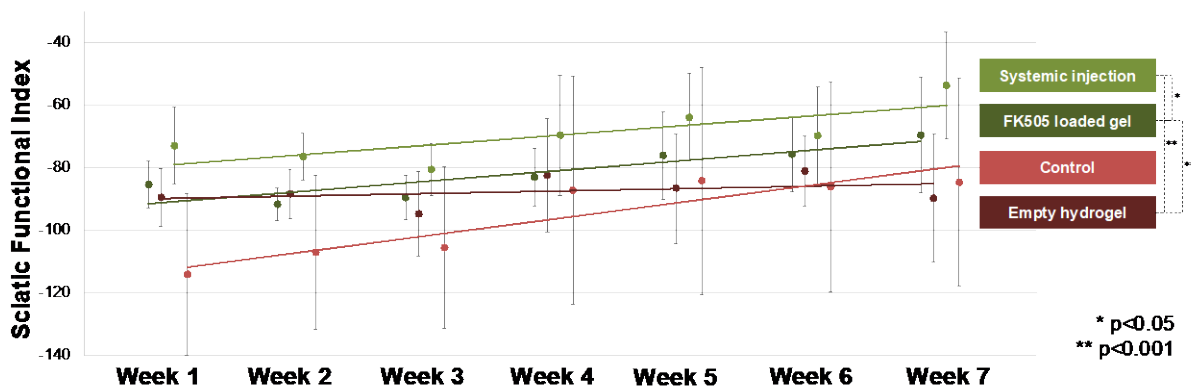
0.8mg/0.2mL/1.5cm FK506 hydrogel over the repair site

## RESULTS - 1

- Blood FK506 levels in the systemic group were **within the therapeutic range** (5-15 ng/mL) throughout the experiment.
- Levels in the local hydrogel-treated group were **below detectable levels**, after the mild initial burst following the surgery (3-7 days).

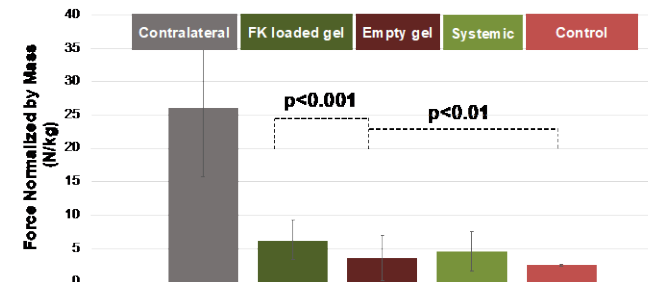
## RESULTS - 2

- At 7 weeks, hydrogel group achieved **greater functional index** than its control.



## RESULTS - 3

- The hydrogel and the systemic groups generated **similar forces**.
- The hydrogel group generated **greater force** than its respective control.



## CONCLUSION

- Local FK506 delivery with hydrogel has the potential to **improve functional outcomes** after nerve injury, while **negating systemic side effects**.
- This hydrogel can be easily applied under direct visualization and could be injected under ultrasound guidance.

## ACKNOWLEDGEMENTS

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