

Development of a Treatment-based Peripheral Nerve Center

Peripheral nerve injuries are *frequent* and involve *many* specialties

- **Peripheral Neurotrauma**
- **Compression Neuropathy**
- **Polyneuropathy**
- **Causalgia / Complex Regional Pain / Fibromyalgia**

Our opportunity: Implement new therapies that enhance treatment outcomes.

***A center* is more than the excellent application of existing treatments.**

Our opportunity: Discover and implement new therapies that enhance treatment outcomes. Here!

The challenges of treating peripheral nerve damage

- **Diagnosis**
- **Regeneration of Myelin**
- **Regeneration of Axons**

Erythropoietin enhances recovery from peripheral nerve damage

EDITOR'S CHOICE

Erythropoietin Enhanced Recovery After Traumatic Nerve Injury: Myelination and Localized Effects

Leigh Sundem, BS,* Kuang-Ching Chris Tseng, PhD,* Haiyan Li, MD,*
John Ketz, MD,† Mark Noble, PhD,‡ John Elfar, MD*†

Erythropoietin Accelerates Functional Recovery After Peripheral Nerve Injury

By John C. Elfar, MD, Justin A. Jacobson, MD, J. Edward Puzas, PhD, Randy N. Rosier, MD, PhD, and Michael J. Zuscik, PhD

Investigation performed at the Department of Orthopaedics and Rehabilitation and the Center for Musculoskeletal Research, University of Rochester, Rochester, New York

The repurposing of 4-aminopyridine: a novel treatment for diagnosing and treating acute peripheral nerve injury

Published online: November 14, 2016

Research Article

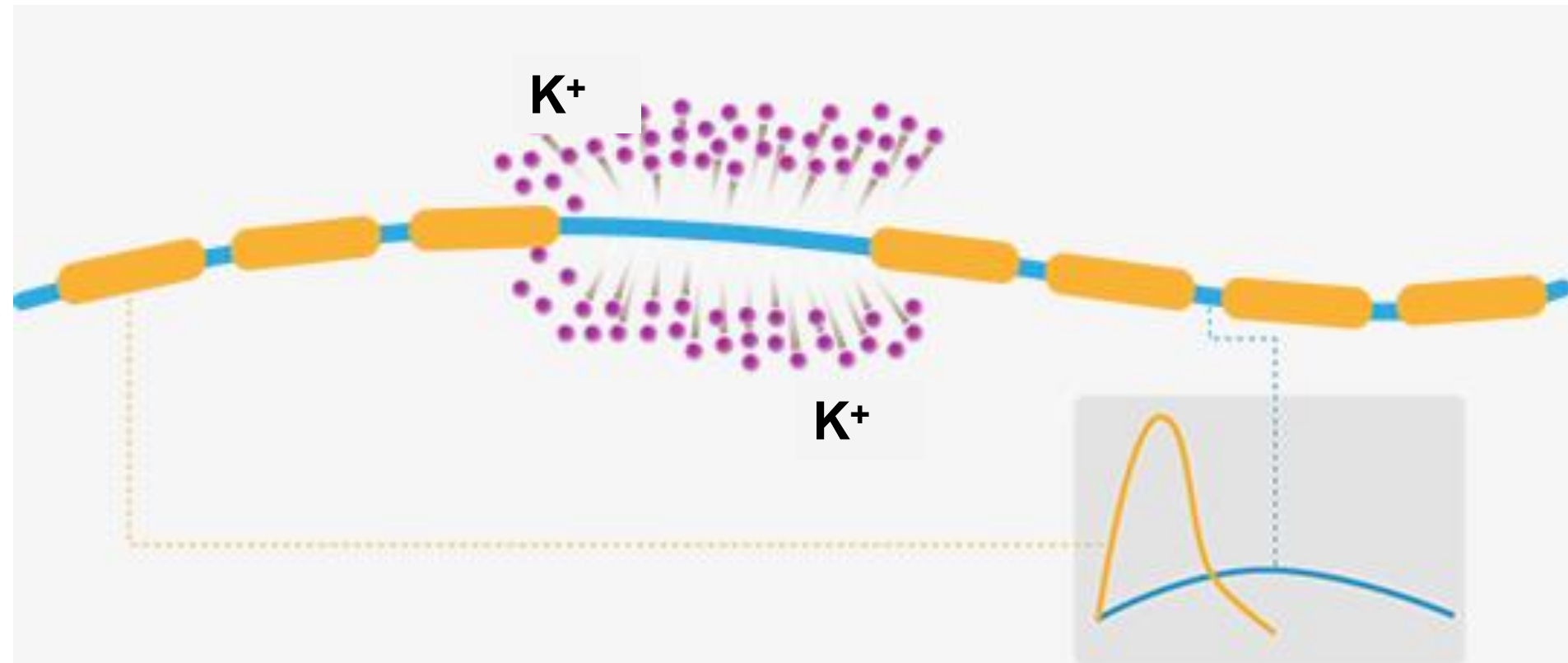


EMBO
Molecular Medicine

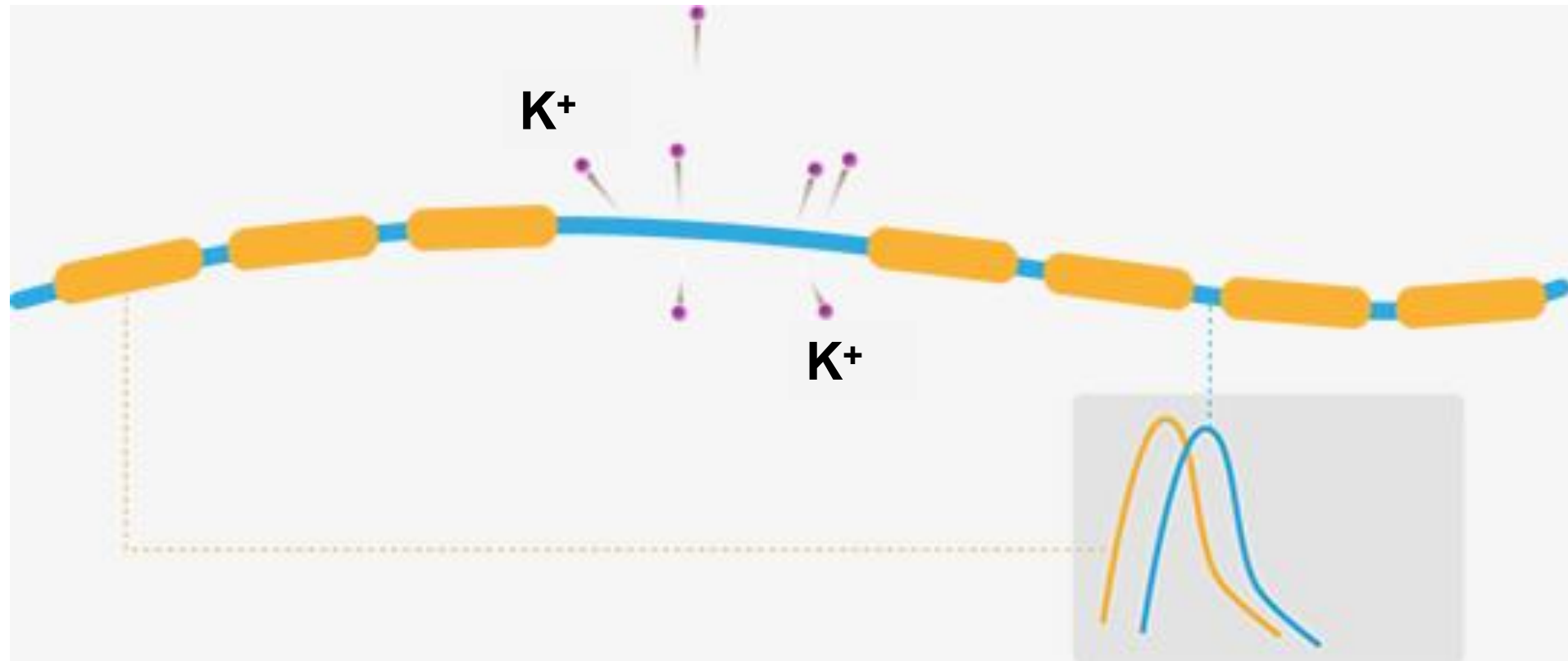
4-Aminopyridine promotes functional recovery and remyelination in acute peripheral nerve injury

Kuang-Ching Tseng^{1,2}, Haiyan Li^{1,3}, Andrew Clark^{3,4}, Leigh Sundem³, Michael Zuscik^{1,3},
Mark Noble^{5,*†} & John Elfar^{1,3,†,**}

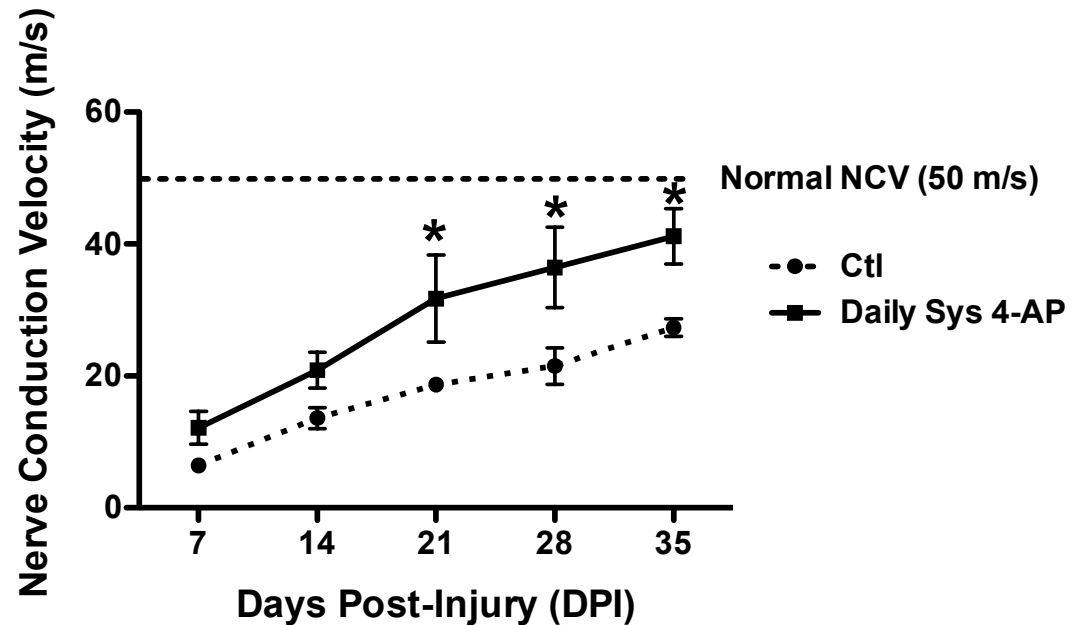
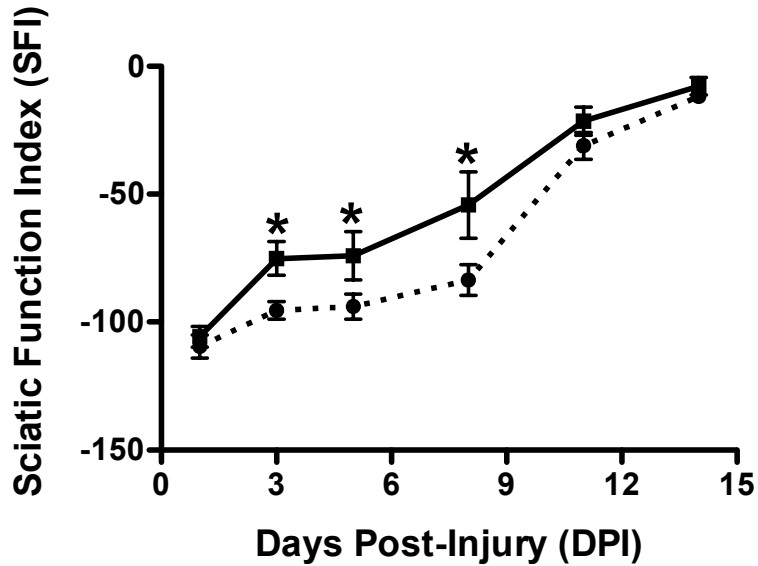
K^+ leakage causes impulse conduction failure when myelin is damaged



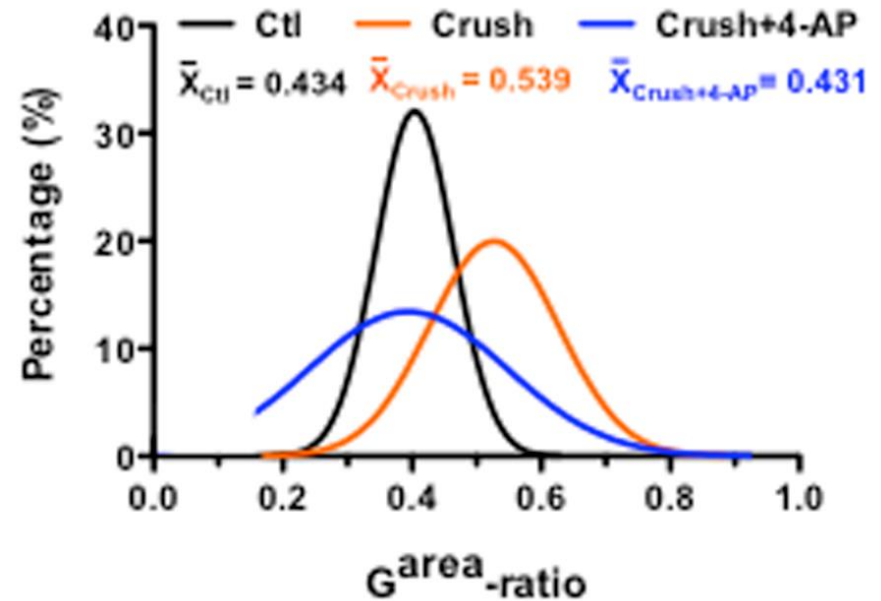
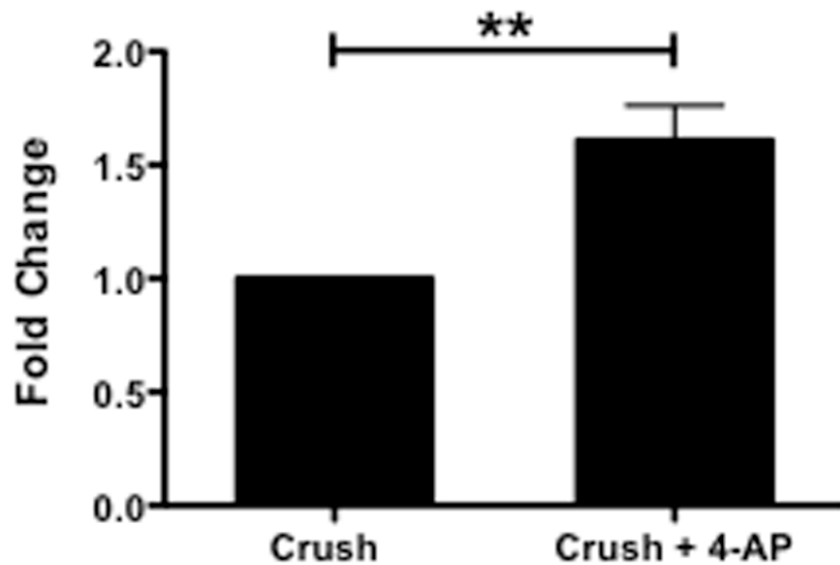
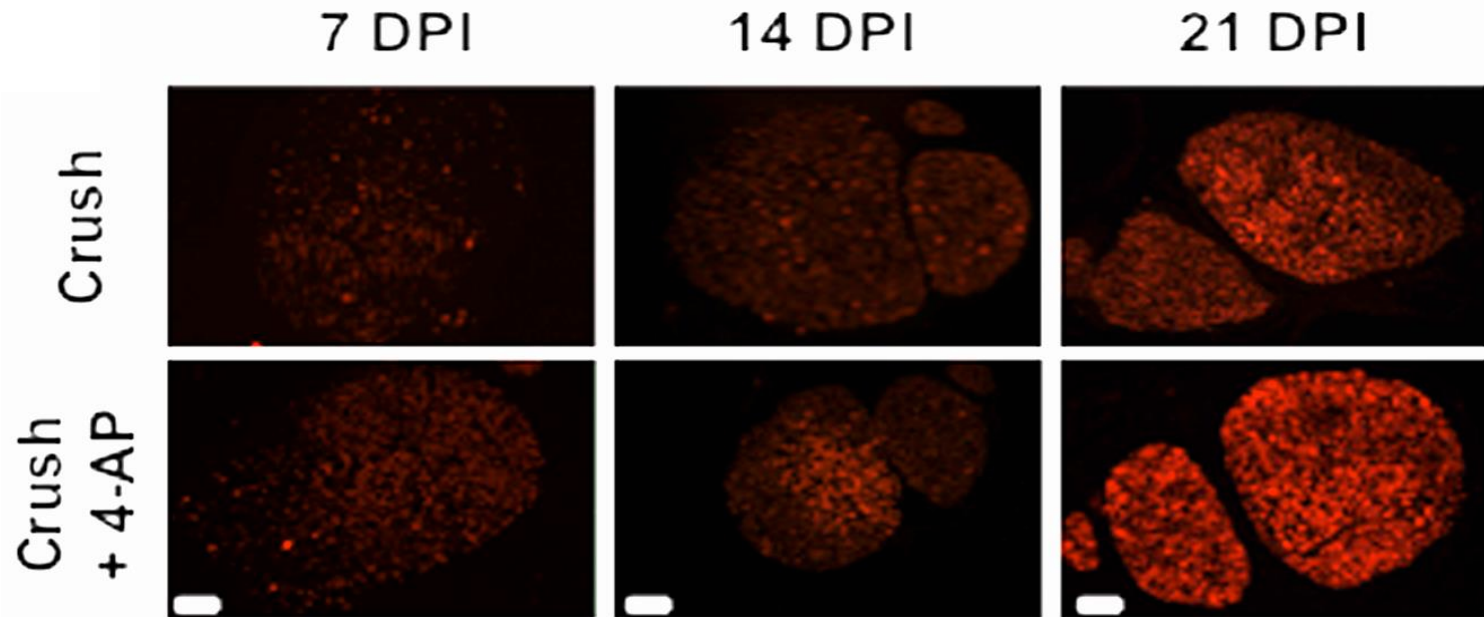
4-aminopyridine (4AP) enables demyelinated axons to conduct impulses



4AP enhances recovery



4AP promotes remyelination



Our Peripheral Nerve Path

- ✓ **Peripheral Neurotrauma**
- ✓ **Compression Neuropathy**
- **Polyneuropathy**
- **Causalgia / Complex Regional Pain / Fibromyalgia**

There are many peripheral nerve centers that focus on the application of **currently available treatments.**

Currently available treatments have remained unchanged for a very long time.

Our opportunity: Implement our new therapies to enhance treatment outcomes.

UR already has many components needed to cement a center to deliver *new* peripheral nerve therapies

Departments

Neurology and Pain Management

Neurosurgery

Urology - Surgery

Physical Medicine and Rehabilitation

Orthopaedics

Stem Cell Regenerative Medicine
Institute

RNI

Radiation Oncology and Oncology

Delmonte Neuroscience Institute

Pediatrics and Genetics

Clinicians

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Michael Stanton

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John Elfar

Sandy Constine

Andrew
Goodman

Ed Messing

Researchers

Mark Noble

Chris Proschel

Margot Proschel

Peter Shrager

Robert Dirksen

Joe Chakkalakal

Success with 4AP sets the stage for further growth and recruitment WITHIN THE PNS

Our first clinical trial for 4AP in acute nerve damage has been approved by the FDA, for enhancing recovery after radical prostatectomy.

The first DoD grant has been approved, and three other grant applications are submitted.

Candidate treatment trials (near term):

Cancer neuropathy, Bell's Palsy, sciatica, central cord Syndrome, Charcot Marie Tooth

Pharmacodiagnosics: Saturday night palsy, Foot drop, brachial plexus palsy

Success with 4AP sets the stage for further growth and recruitment ABOVE THE PNS

Effects in traumatic CNS injury are currently under study.

What happens to the CNS in terms of connectivity and function with PNS treatments?

Opportunities for examining changes in CNS connectivity and function changes following treatment.

Timeline is now

