NervGen Pharma

Restoring Life's Potential

# Corporate Presentation

February 2020

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**Forward-looking statements:** Certain statements in this document about the Company's current and future plans, expectations and intentions, results, levels of activity, performance, goals or achievements, or any other future events or developments constitute forward-looking statements, including, without limitation, statements regarding advancement of NVG-291 toward clinical development, the timing of human trials and regulatory approval, the potential efficacy of the Company's products and technology, and the potential to identify, evaluate and develop other drug candidates. The words "may", "will", "would", "should", "could", "expect", "plan", "intend", "trend", "indication", "anticipate", "believe", "estimate", "predict", "likely" or "potential", or the negative or other variations of these words or other comparable words or phrases, are intended to identify forward-looking statements. Forward-looking statements are based on estimates and assumptions made by the Company in light of management's experience and perception of historical trends, current conditions and expected future developments, as well as other factors that the Company believes are appropriate and reasonable in the circumstances. Many factors could cause the Company's actual results, level of activity, performance or achievements or future events or developments to differ materially from those expressed or implied by the forward-looking statements, including those described in the "Risk Factors" section of the Company's Prospectus, financial statements and Management Discussion and Analysis which can be found on SEDAR.com. All clinical development plans are subject to additional funding. Readers should not place undue reliance on forward-looking statements made in this document. Furthermore, unless otherwise stated, the forward-looking statements contained in this document are made as of the date of this document, and the Company has no intention and undertakes no obligation to update or revise any forward-looking statements, whether as a result of new information, future events or otherwise, except as required by applicable law. The forward-looking statements contained in this document are expressly qualified by this cautionary statement.

# Introductions



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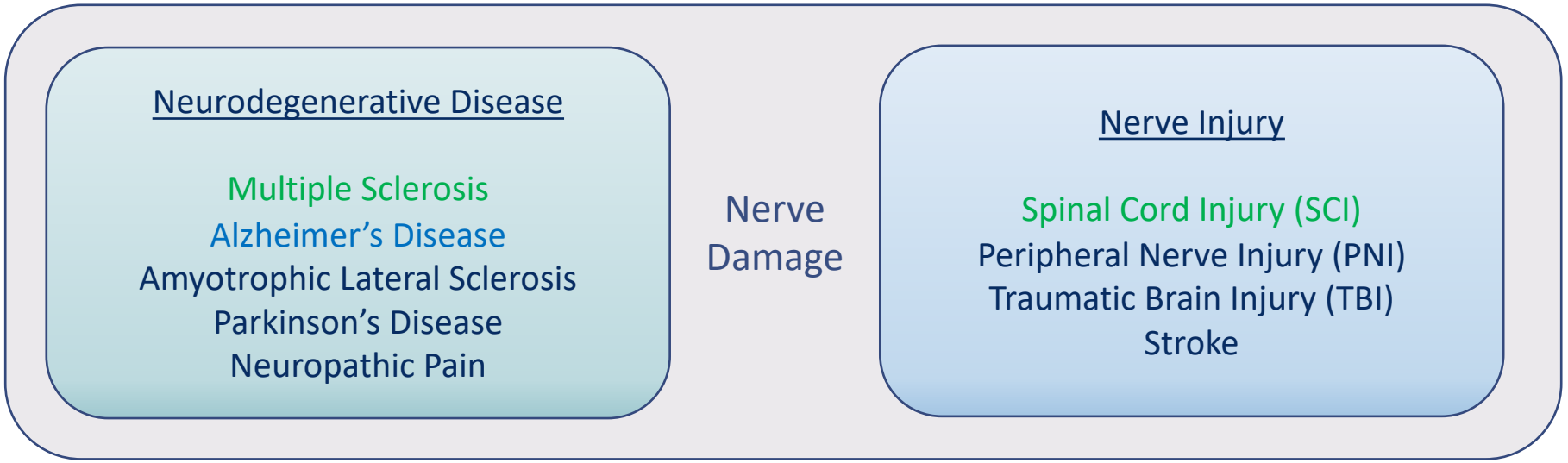
# Restoring the Nervous System's Ability to Naturally Repair Itself

Our goal is to develop novel therapeutics for the treatment of *nerve damage* sustained through nerve injury or neurodegenerative disease



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# NervGen Pharma (TSX: NGEN.V, OTCQX: NGENF)

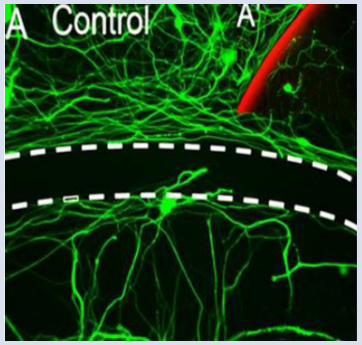
- NervGen Pharma is developing novel therapeutics for nerve injury and neurodegenerative diseases
- NervGen's lead compound is NVG-291
  - Targeting protein tyrosine phosphatase σ (PTPσ), a completely novel receptor
  - Inhibition of PTPσ has been shown to have multiple mechanisms of action that promote restoration of nerve function, and which have been confirmed by independent investigators
  - There is compelling preclinical data with NVG-291 in several models of spinal cord injury (SCI) and multiple sclerosis (MS); evidence suggests that target could be beneficial in treating Alzheimer's disease (AD)
- Nerve injury and neurodegenerative disease represent substantial markets with significant unmet needs
- NervGen has a strong patent portfolio with composition of matter and method of use claims
- NervGen has an experienced management team with a track record in biotech, pharma and capital markets

# NervGen's Technology Comes from Dr. Silver's Seminal Work on Nerve Regeneration

## The Glial Scar Lock[1,2]

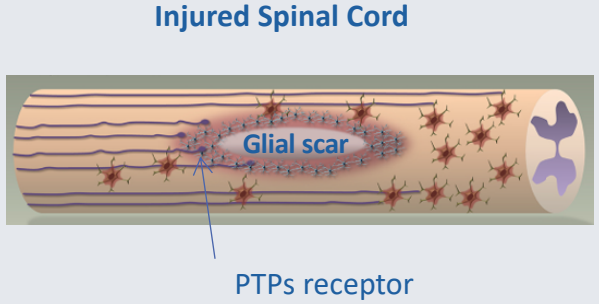
- Glial scars form at the site of injury
- Scars contain CSPG* that traps regenerating nerves
- Primary impediment to nerve regeneration

*chondroitin sulfate proteoglycan



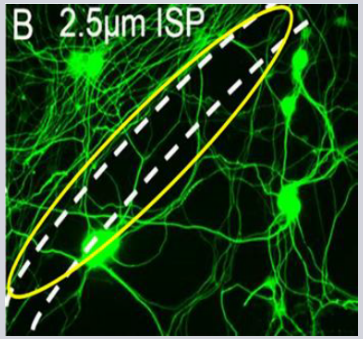

## The Neuronal Receptor, PTPσ[3]

- A receptor on the neuron, PTPσ, binds to CSPG
- Binding prevents the nerve from moving through the scar and regenerating




## The Key to the Lock[4]

- Identified peptides (NVG-291-R) that target PTPσ receptor
- Relieves inhibition to nerve growth
- Promotes nervous system recovery and functional improvement




[1] Silver J. et al Nature Review Neuroscience 2004 5, 146
[2] Tom, V. J et al J Neuroscience 2004 24 6531

[3] Shen Y. et al Science 2009 Oct 23;326(5952):592-6

[4] Lang, B. T. et al Nature 2015 Feb 19;518(7539):404-8

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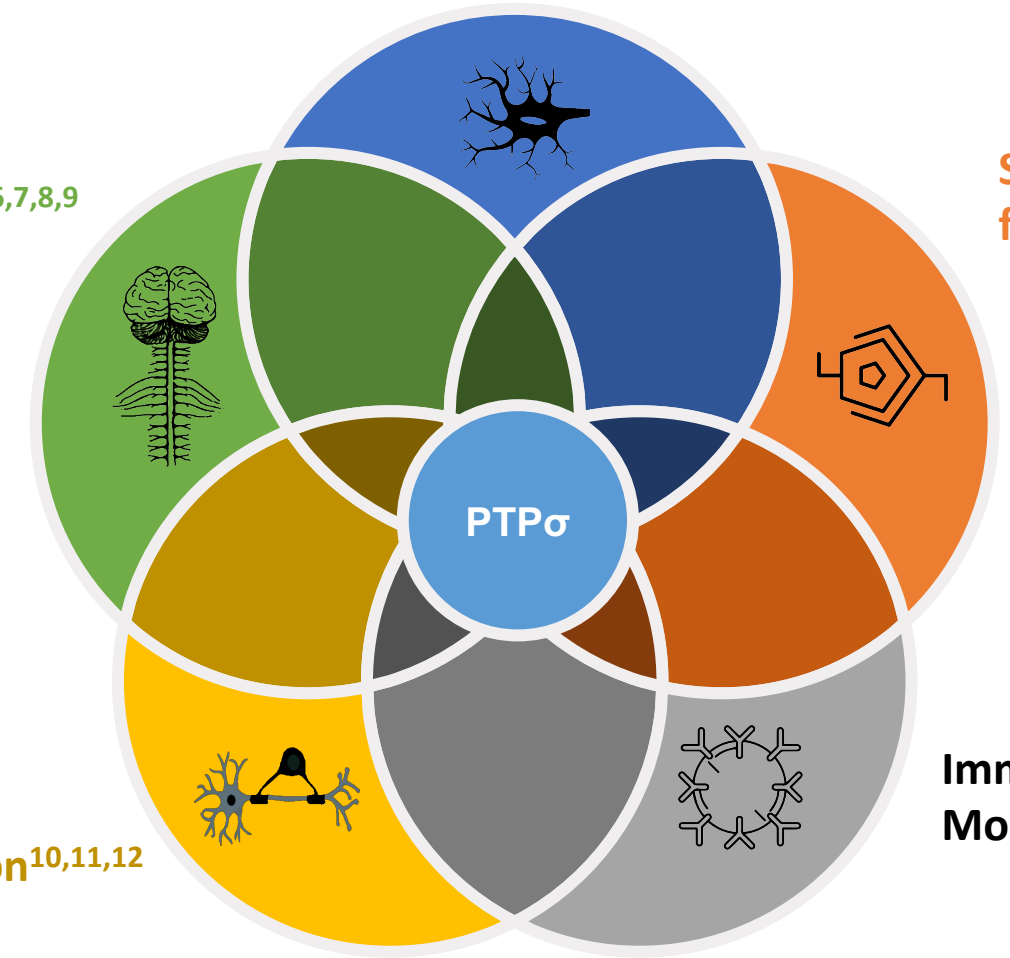
# PTPσ's Modes of Action Supported by Multiple Publications




## Publications


1. Lang et al., 2015
2. Rink et al., 2018*
3. Tran et al., 2018
4. Ham et al, 2019*
5. Sakamoto, 2019
6. Li et al., 2015
7. Gardner et al, 2015
8. Johnsen et al, 2016
9. Yao et al., 2018*
10. Dyck et al., 2018 (a)
11. Luo, et al, 2018
12. Niknam et al, 2019*
13. Farhy-Tselnicker et al., 2017*
14. Dyck et al., 2018 (b)


*Denotes independent studies



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# NervGen Pipeline

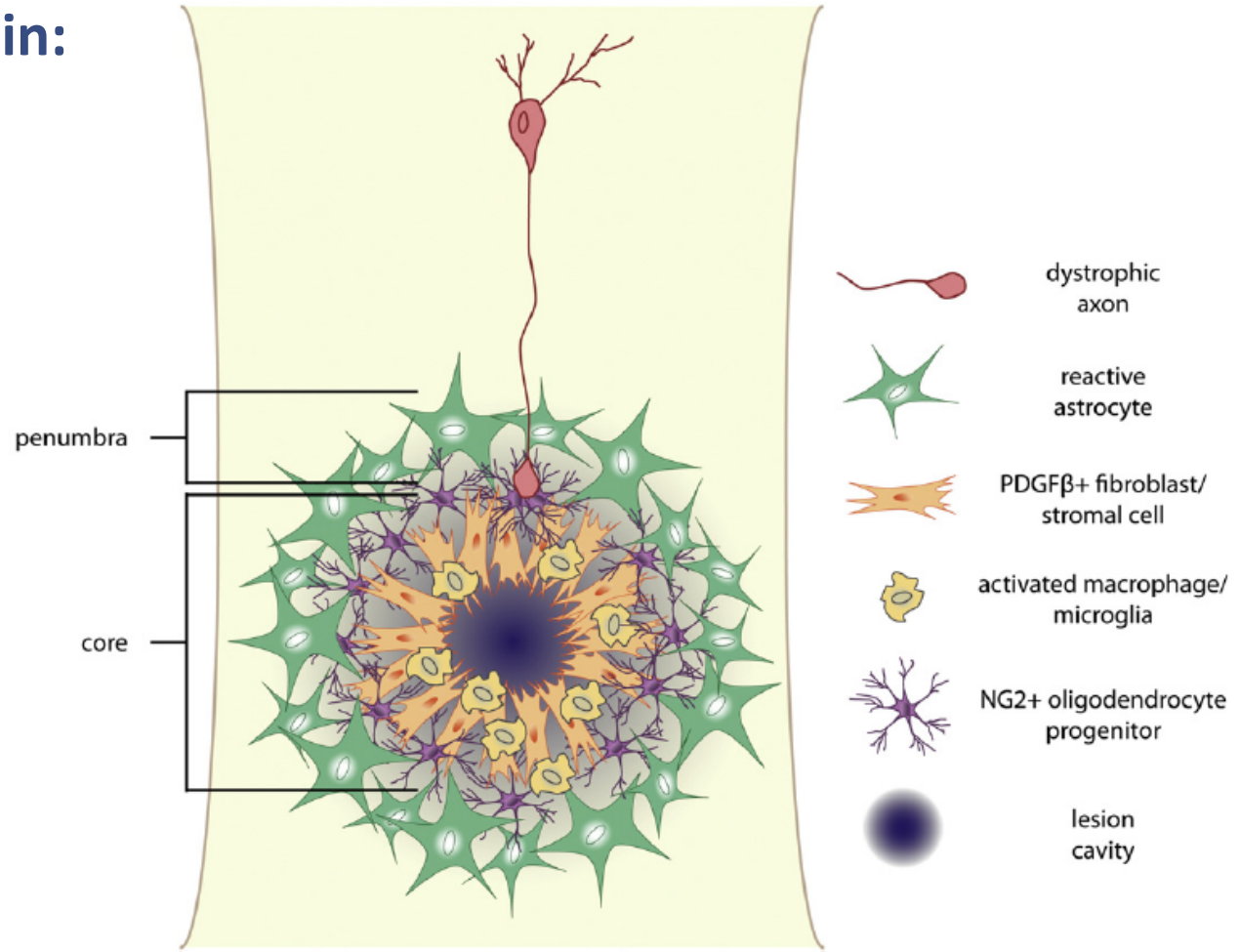
## NervGen is developing a suite of PTPσ peptide inhibitors

- NVG-291-R (also known as intracellular sigma peptide, or ISP) is a valuable research tool used in preclinical studies
- NVG-291 is NervGen's clinical candidate for spinal cord injury and multiple sclerosis, and is a close analog of NVG-291-R
- Additional peptide analogs are being evaluated at this time

# Spinal Cord Injury – Mechanisms of Damage

**Traumatic insult to the spinal cord results in:**

- Damage to neurons
  - Injured axons become dystrophic
  - Failed regeneration
- Upregulation of the perineuronal net
  - Inhibits plasticity
- Demyelination
- Inflammation
- Scar formation




[1] Cregg et al Experimental Neurology 2014, 253



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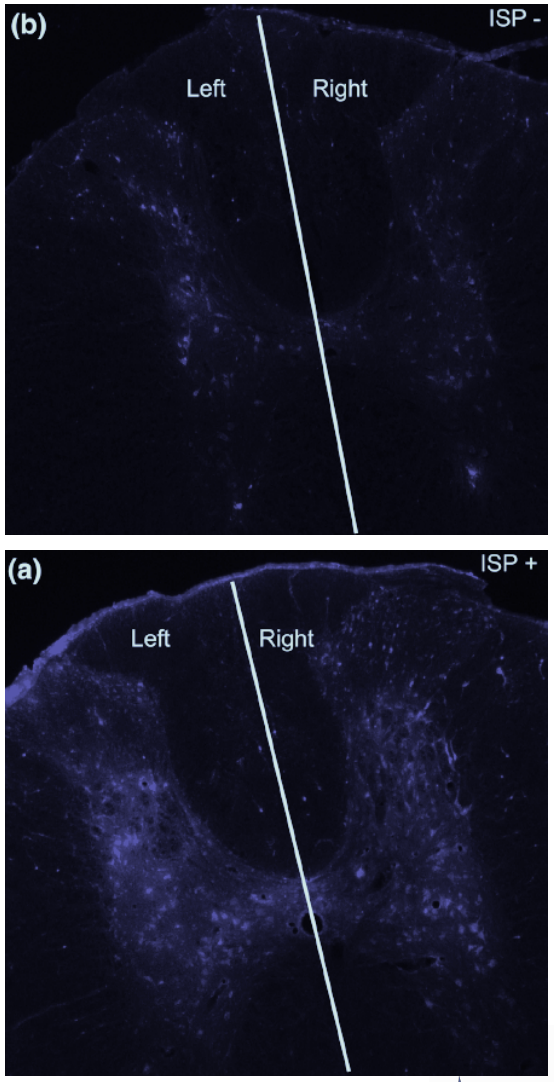
# Spinal Cord Injury: Preclinical Findings

**NVG-291-R treatment of spinal cord injury promotes**

- Regeneration of injured neurons
- Plasticity of spared axons
- Remyelination
- Modulation of immune activation to a reparative state

- Recovery of bladder and locomotor function






[1] Ham et al, Annals of Biomedical Engineering, 2019

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# Spinal Cord Injury: Compelling Preclinical Data

## Rodents with severe spinal cord contusion to model severe human injury

*Systemic, subcutaneous administration*

BBB Scale

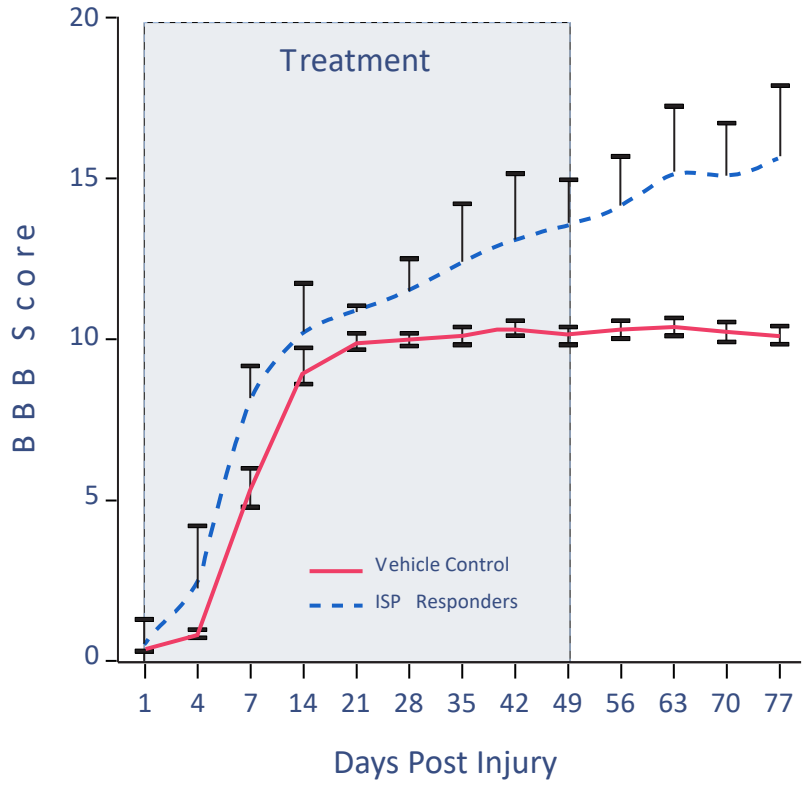
≤8 = limited movement

10 = occasional walking

12 = occasional coordination

13 = frequent coordination

>14 = fine motor movements




*Improvement continues after cessation of therapy*

For BBB only, there was a 33% response rate; for BBB and Bladder function there was an 81% response rate. Placebo response rate was 0%.

Lang, B. T. et al. Nature 2015 Feb 19;518(7539):404-8



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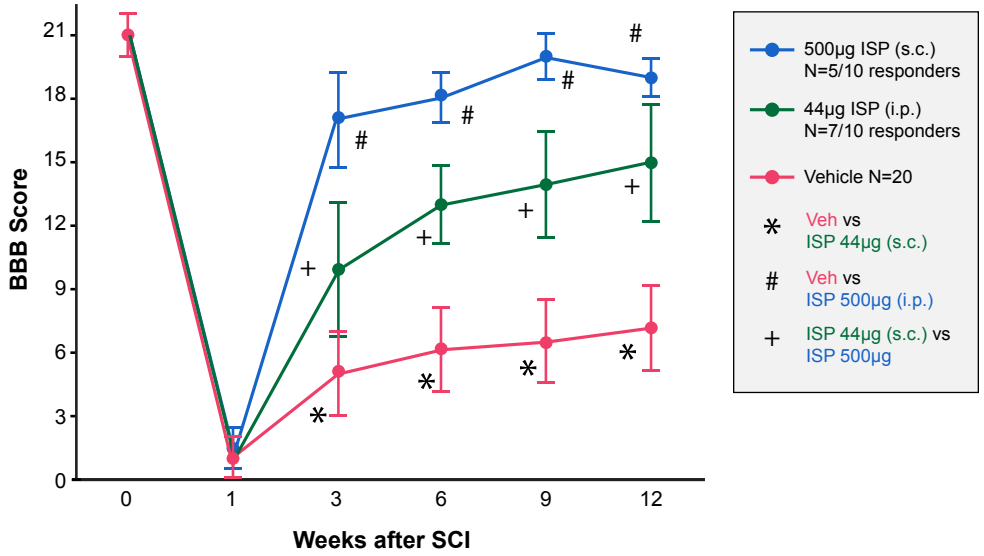
# Spinal Cord Injury: External Preclinical Validation

## Motor function in rats (BBB score) following daily treatment with NVG-291-R

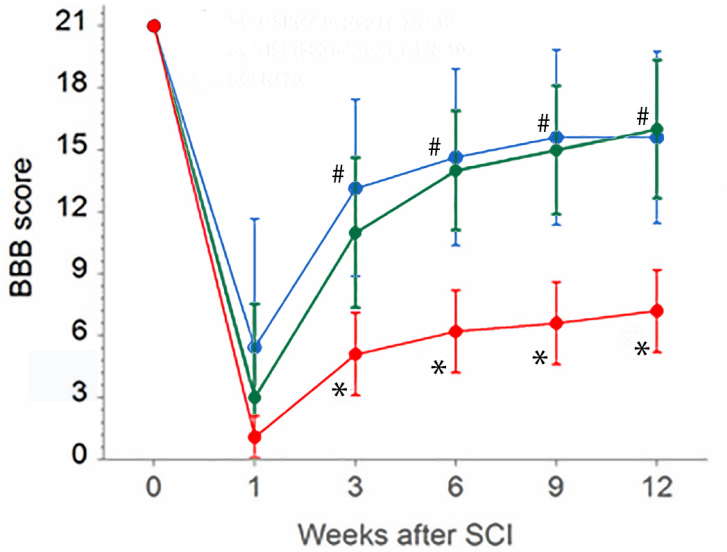
**Responders**







**All animals**




Improvement continues after cessation of therapy at week 7

50 – 70% response rate at 500 µg daily

*Independent demonstration of meaningful dose-dependent improvement in motor function in a severe injury model*

Rink S. et al. Experimental Neurology 2018 309,148-159



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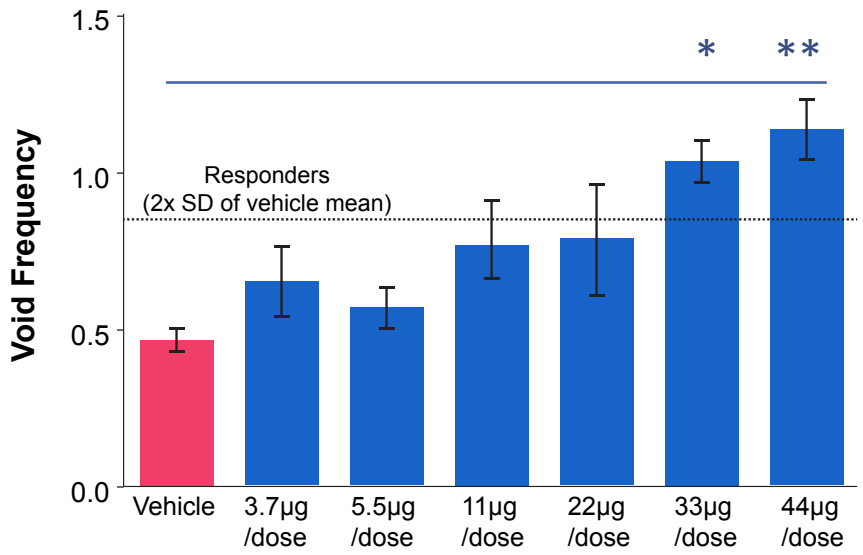
# Spinal Cord Injury: Improved Bladder Function

## Bladder Dose Response




Dose-dependent bladder function improvement in 100% of animals at the two highest dose groups

Bladder function is a key quality of life measure in the paralyzed population

Eliminating catheterization reduces

- Urinary tract infections
- Hospitalizations
- Morbidity
- Healthcare costs

*Bladder, bowel, and sex functions occur in the same nerve region*

Lang, B. T. et al, Nature 2015 Feb 19; 518(7539):404-8



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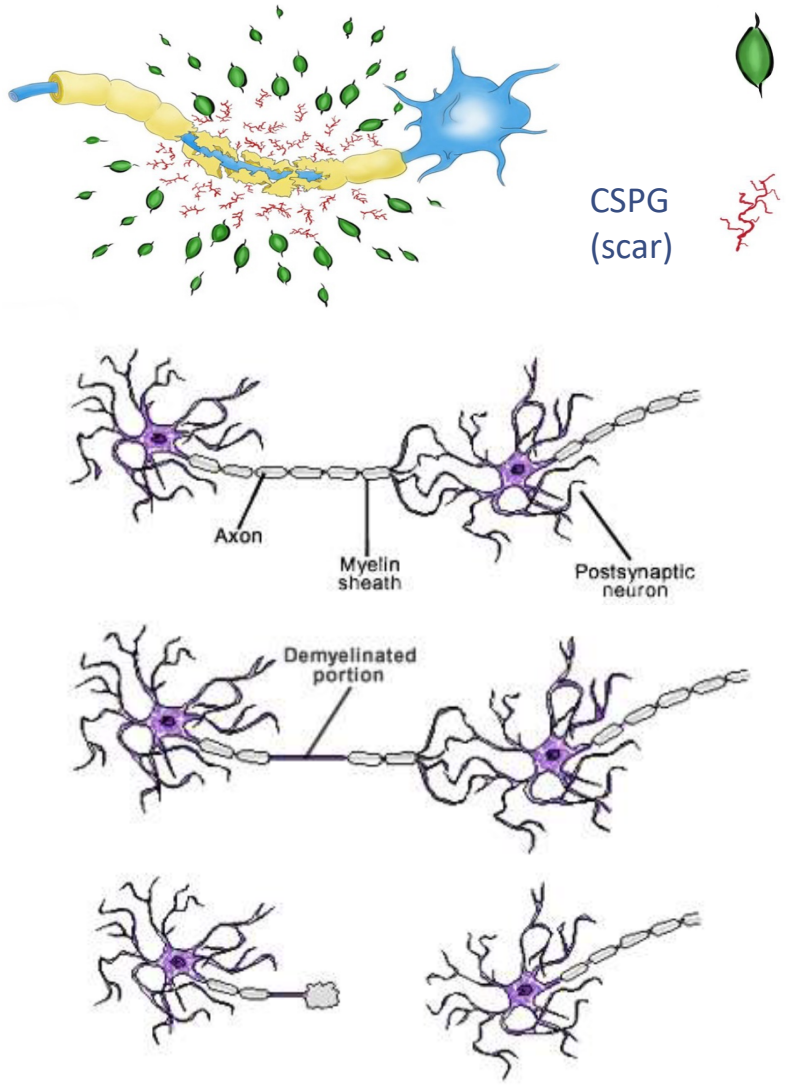
# Multiple Sclerosis: Mechanism of Nerve Damage

**Immune attacks on the spinal cord results in:**

- Demyelination of axons and death of oligodendrocytes
- Scar formation around demyelinated lesion
  - CSPGs in the scar prevent myelinating cells from traveling through the scar to remyelinate the nerve
- Demyelinated axons undergo damage and cause injuries to the neurons
- Current drugs target the immune phase
  - Remyelination and axonal repair are unmet needs

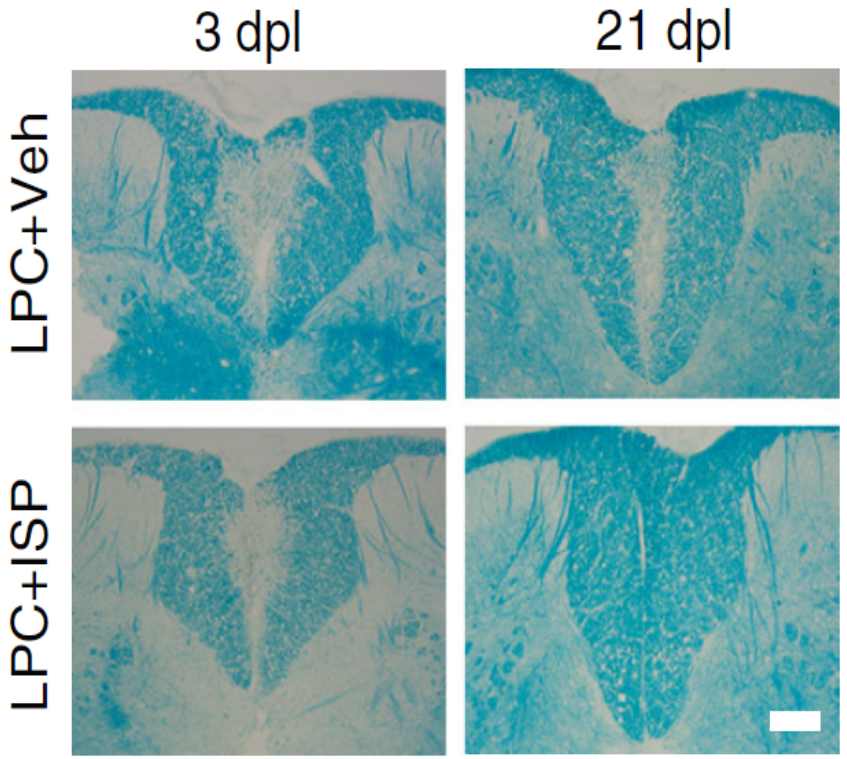



Luo F. et al, Nature Comm. 2018 9, 4126

# Multiple Sclerosis: Preclinical Findings

**NVG-291-R treatment of multiple sclerosis promotes**

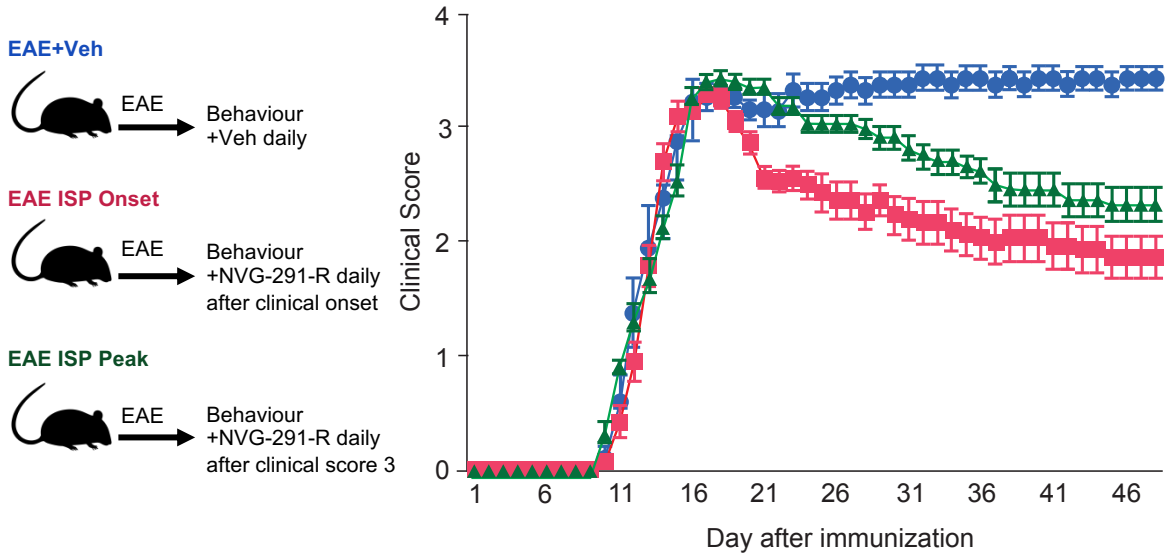
- Oligodendrocyte Progenitor Cell (OPC) survival
- OPC migration through the scar and into the lesion
- OPC differentiation into oligodendrocytes
- Oligodendrocyte remyelination of axons
  - Faster nerve conductance
- Breakdown of inhibitory CSPGs via metalloprotease 2 (MMP2)
- Regeneration of damaged axons
- Plasticity of spared axons
- Recovery of functions in locomotor and vision




Luo F. et al, Nature Comm. 2018 9, 4126

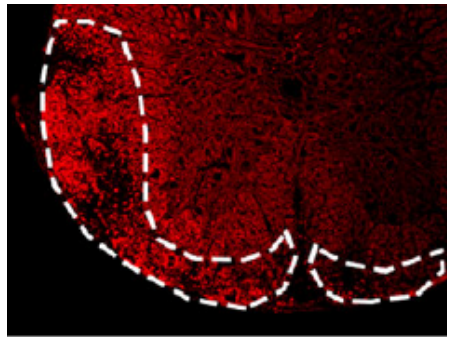
# Multiple Sclerosis: Compelling Preclinical Data

## Delayed NVG-291-R treatment or treatment at symptom onset promotes functional recovery in EAE model

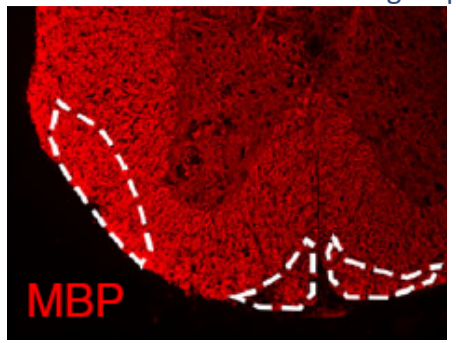



## NVG-291-R promotes remyelination

EAE+control group



EAE+NVG-291-R administered group




*Myelin basic protein

*Remyelination also shown in spinal cord injury models*

# Alzheimer's Disease: Additional Opportunity

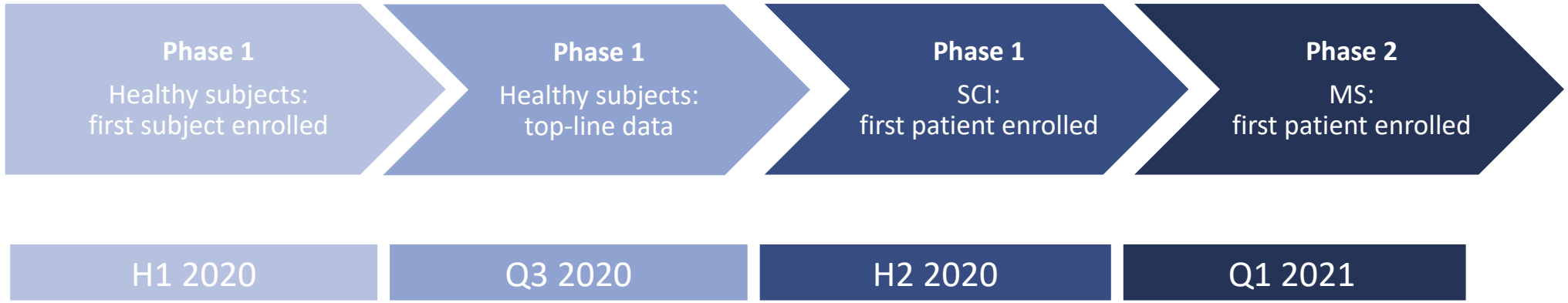
- Formation of senile plaques and several pathological downstream disease features of Alzheimer's disease shown in two mouse models to be critically dependent on the receptor PTPσ
- Targeting PTPσ with NervGen's peptide is a potential therapeutic approach that could curtail Alzheimer's disease progression by decreasing amyloid-β production while fostering axonal sprouting, nerve regeneration, remyelination, and plasticity
- PTPσ has a role in both major causal theories of Alzheimer's disease
    - Amyloid-β plaque formation
    - Neural inflammation
- In summary, treatment with NervGen's peptide may act in several ways to prevent or postpone the cognitive impairments associated with Alzheimer's disease
- NervGen is initiating further exploratory work in this area

# NervGen's Initial Indication Focus

| | Spinal Cord Injury (SCI) | Multiple Sclerosis (MS) | Alzheimer's Disease (AD) |
|---|---|---|---|
| US Population | • ~17,000[1] acute injures per year<br>• ~291,000[2] people living with chronic SCI | • ~913,000[3] diagnosed prevalent cases of MS | • Estimated that there are 5,800,000[4] patients in the US living with AD |
| Current Pharmacological Therapies | • Current therapies focus on relieving acute inflammation to limit damage | • Current therapies mainly seek to (i) manage acute relapse; (ii) prevent future relapse, and accumulation of disability; and, (iii) manage symptoms<br>• Most approved disease modifying therapies are immunomodulatory agents that reduce frequency of relapse, and accumulation of disability | • Treatment of associated symptoms (ex agitation)<br>• No approved treatments for progression of the disease |
| Unmet Need | • Therapies that help patients regain lost function after acute injury | • Long term neurodegeneration in patients with progressive disease is not well treated, leading to an accumulation of disabilities | • Currently no therapies address progression of the disease, and treatments of symptoms are marginal |

[1] https://www.nscisc.uab.edu/Public/Facts%20and%20Figures%202019%20-%20Final.pdf
[2] https://www.nscisc.uab.edu/Public/Facts%20and%20Figures%202019%20-%20Final.pdf
[3] https://www.nationalmssociety.org/About-the-Society/MS-Prevalence/MS-Prevalence-FAQ
[4] https://www.alz.org/alzheimers-dementia/facts-figures

# NVG-291 Development Plan




*Multiple near-term clinical milestones*



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# Strong and Growing IP Portfolio – Multiple Patents Issued

## *Composition of Matter*

Claims cover

- Inhibitors of PTPσ, including NVG-291-R, NVG-291 and other analogs
- Exclusive worldwide rights to use the technology to research, develop, make, have made, use, dispose, offer to dispose and import licensed products for all indications

## *Method of Use*

Claims cover

- Inhibiting PTPσ activity, signaling and function
- Treating neural injury, including peripheral nerve injury and spinal cord injury
- Treating root avulsion
- Treating heart disease and injury

# Experienced Management Team

| | |
|---|---|
| **Paul Brennan**, BSc, MSc<br>**President & CEO** | • Over 30 years of biotechnology and pharmaceutical business development and product planning experience<br>• Comprehensive list of transactions from M&A to licensing to corporate restructuring |
| **Lloyd Mackenzie**, BSc<br>**COO** | • Over 25 years experience in the biopharmaceutical industry with expertise in chemistry, manufacturing and control, medicinal chemistry, and biochemistry<br>• Author of 15 scientific publications and inventor on four patents |
| **Rob Pilz**, CPA, BComm<br>**CFO** | • 20+ years in strategic and operational planning, corporate finance, M&A, partnering, accounting, audit, HR, and project management<br>• CFO positions in three Deloitte Technology Fast 50™ companies |
| **Amy Franke**, BS, MBE<br>**VP, Clinical Operation** | • Managed over 25 clinical trials including two Phase 3 trials<br>• Experience working at and managing multiple large clinical contract research organizations |
| **Denis Bosc** PhD<br>**VP, Chemistry, Manufacturing and Control** | • 15+ years of manufacturing experience with small molecule to antibody-based drugs<br>• Strong knowledge of Good Manufacturing Practice and extensive experience working with contract development manufacturing organizations |



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# Share Capital & Structure

| | | |
|---|---|---|
| Exchange/Market: Ticker | **TSX-V: NGEN** | **OTCQX: NGENF** |
| Recent Share Price (January 28, 2020) | CA$3.22 | US$2.43 |
| Shares Outstanding | 29.4 million (11.4 million restricted) | |
| Fully Diluted | 33.2 million (~3.1 million options under plan plus 700,000 agents options) | |
| Market Capitalization (January 28, 2020) | CA$91.8 million | US$71.3 million |
| 52-week Range | CA$1.23 – CA$3.25 | US$0.6488 – US$2.49 |
| Insider Ownership | 21% | |
| Cash & Cash Equivalents (September 30, 2019) | CA$6.3 million | US$4.8 million |



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# Investment Highlights

- ✓ Compelling technology platform with data published in multiple peer-reviewed journals
- ✓ Addressing a significant unmet medical need for treatment of nerve damage due to trauma/disease
- ✓ Advancing spinal cord injury and multiple sclerosis indications towards the clinic with near term milestones
- ✓ Strong and growing IP portfolio with significant remaining patent life
- ✓ Life science-savvy board, management team & scientific advisors



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