## **Improving people's lives**

NFX88, a potential "best in class" therapy for **neuropathic pain** 





## **Neuropathic pain**

- Typically, neuropathic pain (NeP) is progressive for approximately 3 to 5 years before reaching a plateau and can persist for many years after the acute injury.
- NeP is usually severe in nature (VAS $\geq$ 7 out of a maximum of 8)<sup>1</sup>, which can lead to pain that is difficult for the patient to bear.
- 17% of NeP patients have health-related quality of life scores equivalent to "worse than death"<sup>2</sup>.
- NeP can result in physical disability and limitations in movement.
- NeP has a substantial negative impact on the patient quality of life, for example affecting sleep and mood.

#### 1 - 10.1007/s00586 - 005 - 1044 - x2 - 10.1016/j.pain.2014.07.001

- 6.Cancer





## **Global market of** neuropathic pain

- Neurofix approximates a potential market of €1,300 million by 2031 (average market penetration of 38.3%). The estimated therapy cost per patient, is between €3,000 and €4,000 per year.
- Only 40% of the affected population gets some kind of relief with current treatments.
- The market has more potential: 7%–8% of the European and American population is affected, although 20% of adults could be.
- Healthcare costs could be reduced: the NeP market represents 0.33% of GDP healthcare spending ( $\in$  33 billion) in European countries.



#### The global Pregabalin market is expected to be of \$596 billion by 2029.



#### The Pregabalin market is estimated to grow at a CAGR of 3.53% from 2022 to 2029.



## NFX88, a molecule designed to treat neuropathic pain

- ✓ **NFX88 initiates an intracellular cascade** through GPCR signaling in damaged neurons, by inducing changes in the composition/structure of the cellular lipid membrane that leads to the modulation of these receptors (GPCRs), changing the activity of enzymes such as Adenylyl Cyclase, PKA and Rho kinase.<sup>3</sup>
- ✓ **NFX88 initiates the expression of genes** involved in inflammation and pain:
  - NeP is caused by lysophosphatidic acid in patients with spinal cord injury. PLA1, PLA2 and PLD phospholipases participate in the production of lysophosphatidic acid.<sup>4</sup>
  - NFX88 reduces the expression of PLA1, PLA2 and PLD in the area of spinal cord injury by up to 95%.





## Additional advantages of the mechanism of action

The **main advantage** of the novel mechanism of action of NFX88 is that this molecule directly acts on the causes of pain and not simply on its mitigation. In this way, NeP is treated as a specific pathology and not as a consequence of the spinal cord injury.

- ✓ NFX88 regulates the structure and biophysical properties of neurons, as it is incorporated into the glycerophospholipid fraction of the plasma membrane, particularly made up of phosphatidylcholine and phosphatidylethanolamine, and induces changes in the levels of the main membrane lipid species: phosphatidylethanolamine and sphingomyelin. <sup>5,6,7</sup>
- ✓ NFX88 initiates the expression of genes involved in the regeneration of neurons.<sup>8</sup>
  - 5 10.1073/pnas.1115484108 6 - 10.1073/pnas.111834910 7 - 10.1016/j.bbamem.2013.01.013 8 - 10.1371/journal.pone.0189151





Passage of messages along the axon



## High activity against neuropathic pain in humans

NFX88 relieves pain more effectively than competitors on the market

NFX88 is **50% more** 

effective than competitors

in reducing overall sensitivity

It is **4.5 times more effective than competitors** in antinociceptive action

It is more than twice as effective as competitors in reducing reflex hypersensitivity







## NFX88 has a good safety profile

NFX88 prevents pain-

induced anxiety

NFX88 did **not cause any** serious adverse events or side effects in any of the 48 patients in the study





Product	Mode of action	Company	Status
Pregabalin (Lyrica)	Anti-convulsant (GABA modulator)	Pfizer	Approved
Gabapentin (Neurontin, etc)	Anti-convulsant (GABA modulator)	Pfizer	Approved
Gabapentin (Gralise)	Anti-convulsant (GABA modulator, extended release)	Depomed	Approved
Tapendatol (Nucynta ER)	$\mu\text{-}\text{opioid}$ receptor agonist / noradrenaline reuptake inhibitor	Johnson & Johnson	Approved
Duloxetine (Cymbalta)	Anti depressant (serotonin-norepinephrine reuptake inhibitor)	Eli Lilly	Approved
Lidocaine (Lidoderm)	Transdermal patch	Grünenthal / Teikoku	Approved
Mirogabalin	Anti-convulsant (GABA modulator)	Daiichi Sankyo	Phase III
Gabapentin enacarbil (Horizant)	Anti-convulsant (GABA modulator)	GSK	Phase II
BIIB074 (Vixotrigine)	Nav 1.7 inhibitor	Biogen	Phase II
Cebranopadol	Opioid receptor inhibitor	Grünenthal	Phase II
VX-150	Nav 1.8 inhibitor	Vertex	Phase II
Ralfinamide	Analgesic (inhibitor of sodium channels)	Newron Pharma	Phase II
PL265	Enkephalin-degrading enzyme inhibitor	Pharmaleads	Phase Ib
BIIB095	Nav 1.7 inhibitor	Biogen	Phase I

NFX88 directly targets the causes of pain All competitors, whether their products are approved or under development, focus on analgesia through products or mechanisms of action similar to those already on the market.

NFX88 has fewer side effects Competitors are antidepressants, cannabinoids, neuromodulators and brain-stimulating drugs. All of them have relevant adverse effects such as: dizziness, peripheral edema, weight gain, ataxia, fatigue, drowsiness and suicidal behaviour.



## **Competitors in the neuropathic pain** market

#### NFX88 is more effective

Current drugs show low efficacy as they only reduce pain by around 35% in 38% of cases.

## NFX88 may have patent protection until 2043

NFX88 protection in Europe, USA, Japan, Canada, Russia, Africa and Brazil

Neurofix holds an **exclusive license** for the development of different products, including NFX88, **in the NeP field.** 

**Freedom To Operate (FTO)** for the manufacturing and marketing of NFX88 by Neurofix.

In preparation: **Patent for NFX88 dosing in NeP for spinal cord injuries.** This patent would protect NFX88 for another 20 years, **until 2043.**  In November 2022 we will file an orphan drug application. If approved, it will **extend the NFX88 patent for another 10** years, until 2033.

## Scientific Advisor team



José Javier Muruzabal Manufacturing Advisor



Luisa Segura Galenic



Pablo Montes Communication and Media Director



Claudio Santos Advisor



Dr. Ängel Gil Principal iInvestigator

# Operative team



Miguel Ángel Ávila Co-founder & CEO



in

Eva M<sup>a</sup> Ferrero, PhD Corporate Strategy Director

Jesús Vicente Financial Director



Daniel Bermejo Project Manager



Dr. Antonio Oliviero Clinical Director



## Business Advisor team



Manuel Illescas Intellectual Property Advisor



Manuel Matutes Investor



Carlos Ochoa Legal Advisor



David López Mateos Business Advisor

### **Investment round**

Investment:	€7 million
Pre-money:	€22 million
Non-dilutive financing:	€3 million
Funds last until:	2Q2024
Main objective:	Finish phase

	FY 2022	FY 2023	FY 2024	FY 2025
Revenues			11.250.000	20.000.000
Cost	-591.485	-4.868.786	-5.039.162	-5.530.671
Phase IIA	-166.001			
Phase IIB/III		-4.204.793	-4.253.503	-4.703.875
<b>Orphan Drug Designation</b>	-96.390			
Other costs	-329.095	-663.992	-785.659	-826.796
EBITDA	-591.485	-4.868.786	6.210.838	14.469.329

"Other costs" include, for example, labor costs and legal advisory expenses. Both "Cost" and "Revenues" are estimated for 2023 to 2025.

Future funding (order of preference):1. License2. M&A

3. IPO



#### IIB/III in NeP in EU



	2021		2022		2023		2024		2
	1H	2 H	1H	2H	1H	2 H	1H	2H	
Phas	se IIA (EU)								
					Phase IIB	/ III (EU)			
	Regulatory Filing					EMA: Orphan			
					FD	A: prelN	D		
		nercial unch				Comn	nercial Ma	nufactur	in

# Timeline for the development of NFX88





## Thanks for your interest

Contact Miguel Ángel Ávila CEO



miguelangel.avila@neurofixpharma.com



neurofixpharma.com





