



Innovative Medicines Initiative

Euro
pain

Europain - Understanding Chronic Pain and Improving its Research in Europe

Elisabetta Vaudano, *IMI, Belgium,*



www.imi.europa.eu

*EFIC® Symposium The societal impact of pain, Hamburg, Germany,
23rd September 2011*

What is Chronic Pain?



Innovative Medicines Initiative

Acute pain is the response to an injury, and lasts until the injury is healed.

As such acute pain is a physiological response

Chronic pain is pain that persists long after the injury has healed. Sometimes its cause is not clear.

Chronic pain is a pathological condition.

Chronic pain frequently carries a stigma, and misperceptions of laziness or pain killer addictions follow.

Often misunderstood, chronic pain is very real



EFIC® Symposium *The societal impact of pain, Hamburg, Germany,*
23rd September 2011

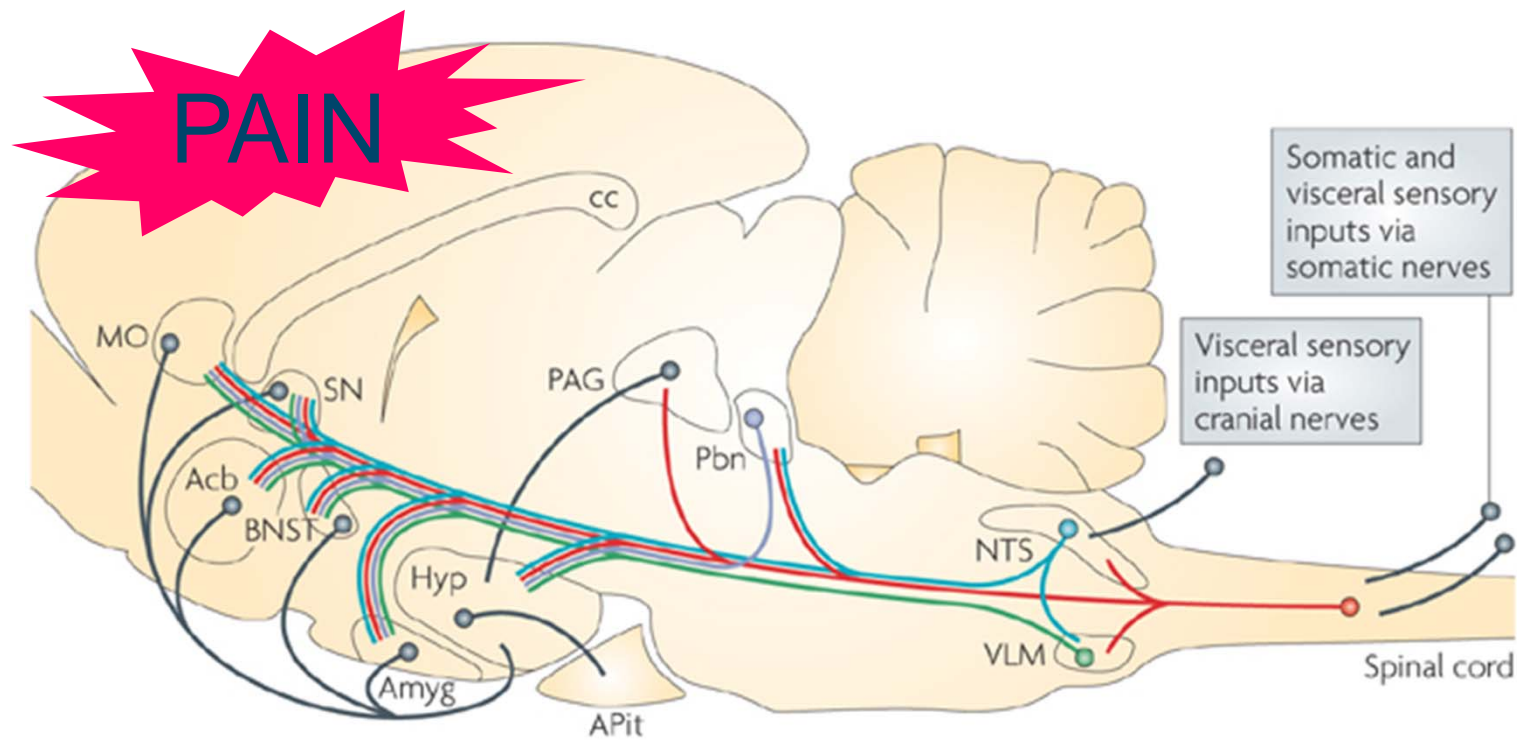


efpia

The Chain Transmission of Pain



Innovative Medicines Initiative



Nature Reviews | Drug Discovery

EFIC® Symposium The societal impact of pain, Hamburg, Germany,
23rd September 2011



What is Chronic Pain:



Innovative Medicines Initiative

Chronic pain comes in two main varieties.

The first, **inflammatory pain**, occurs when a persistent injury (e.g. a burn or arthritis) results in an enhanced sensitivity of pain-sensitive nerve endings, thus increasing the sensation of pain.

The second variety of chronic pain, **neuropathic pain**, occurs when nerve damage causes on-going pain and a hypersensitivity to stimuli.

Neuropathic pain, which is often lifelong, is a surprisingly common condition and is poorly treated by current drugs.

Neuropathic pain is seen in patients with diabetes (affecting 3.7m patients in Europe, USA and Japan) and as a painful after-effect of shingles, and is often being a consequence of cancer chemotherapy. Neuropathic pain is also a common component of lower back pain and other chronic painful conditions.



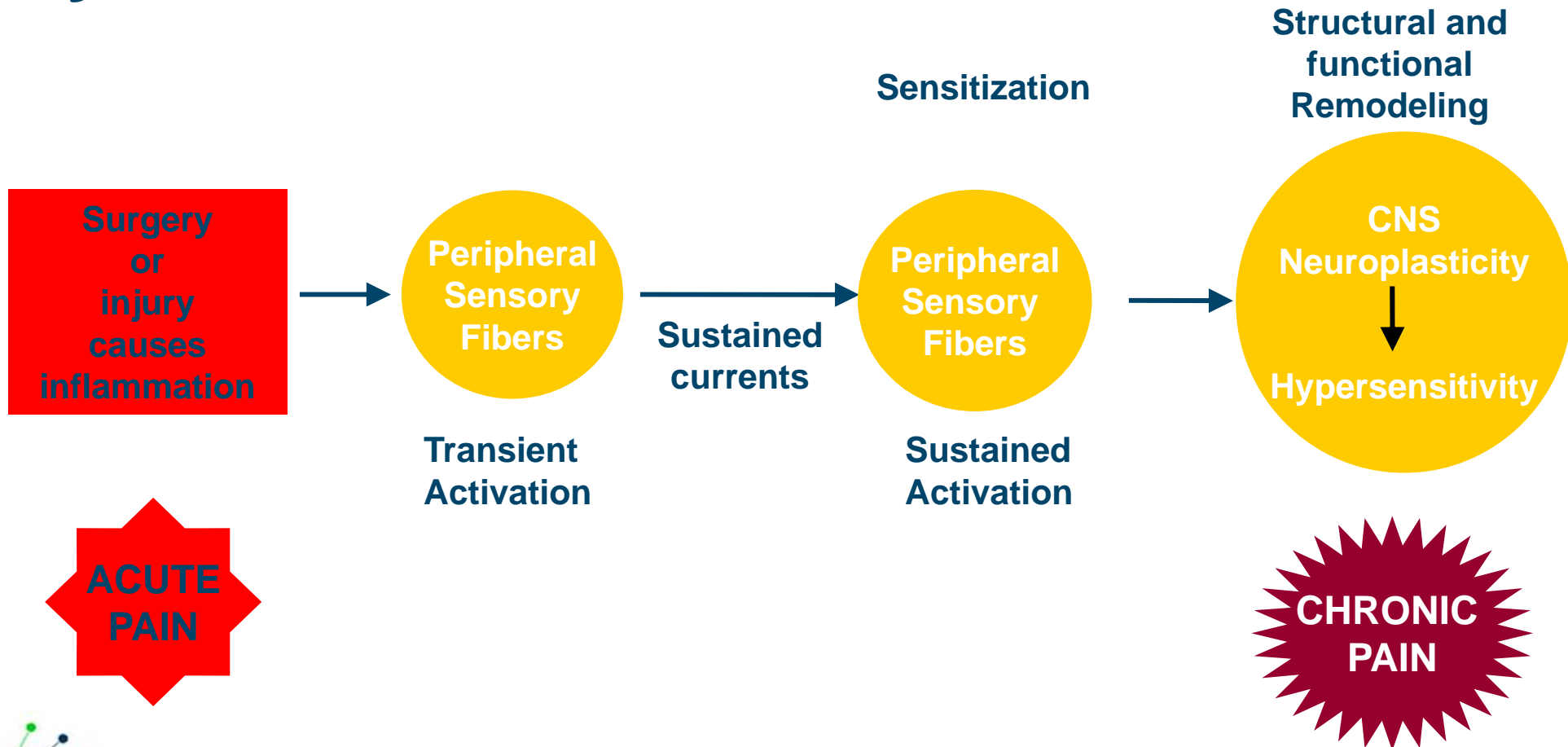
*EFIC® Symposium The societal impact of pain, Hamburg, Germany,
23rd September 2011*



What is Chronic Pain: A Nervous System Disease



Innovative Medicines Initiative



ACUTE PAIN

CHRONIC PAIN



Woolf CJ, et al. *Ann Intern Med.* 2004;140:441-451; Petersen-Felix S, et al. *Swiss Med Weekly.* 2002;132:273-278; Woolf CJ. *Nature.* 1983;306:686-688; Woolf CJ, et al. *Nature.* 1992;355:75-78.

EFIC® Symposium The societal impact of pain, Hamburg, Germany, 23rd September 2011

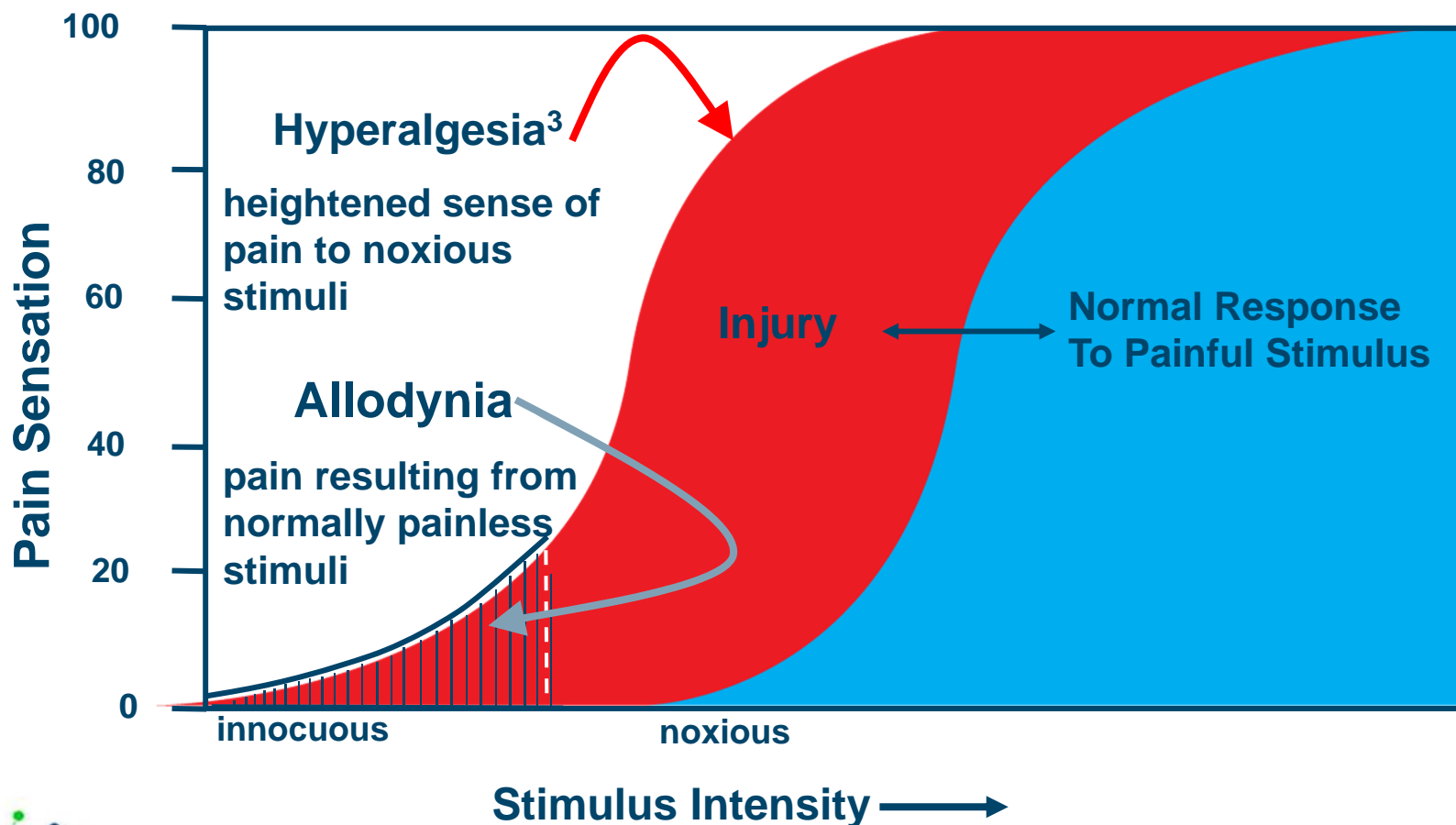


What is Chronic Pain?

Neuroplasticity in Pain Processing



Innovative Medicines Initiative



1. Woolf CJ, Salter MW. *Science*. 2000;288:1765-1768.
2. Basbaum AI, Jessell TM. *The perception of pain*. In: Kandel ER, Schwartz JH, et al. eds. *Principles of Neural Science*. 4th ed. New York, NY: McGraw-Hill; 2000:479.
3. Cervero F, Laird JMA. *Pain*. 1996;68:13-23.



EFIC[®] Symposium The societal impact of pain, Hamburg, Germany, 23rd September 2011



Chronic Pain, a Devastating and Widespread Problem

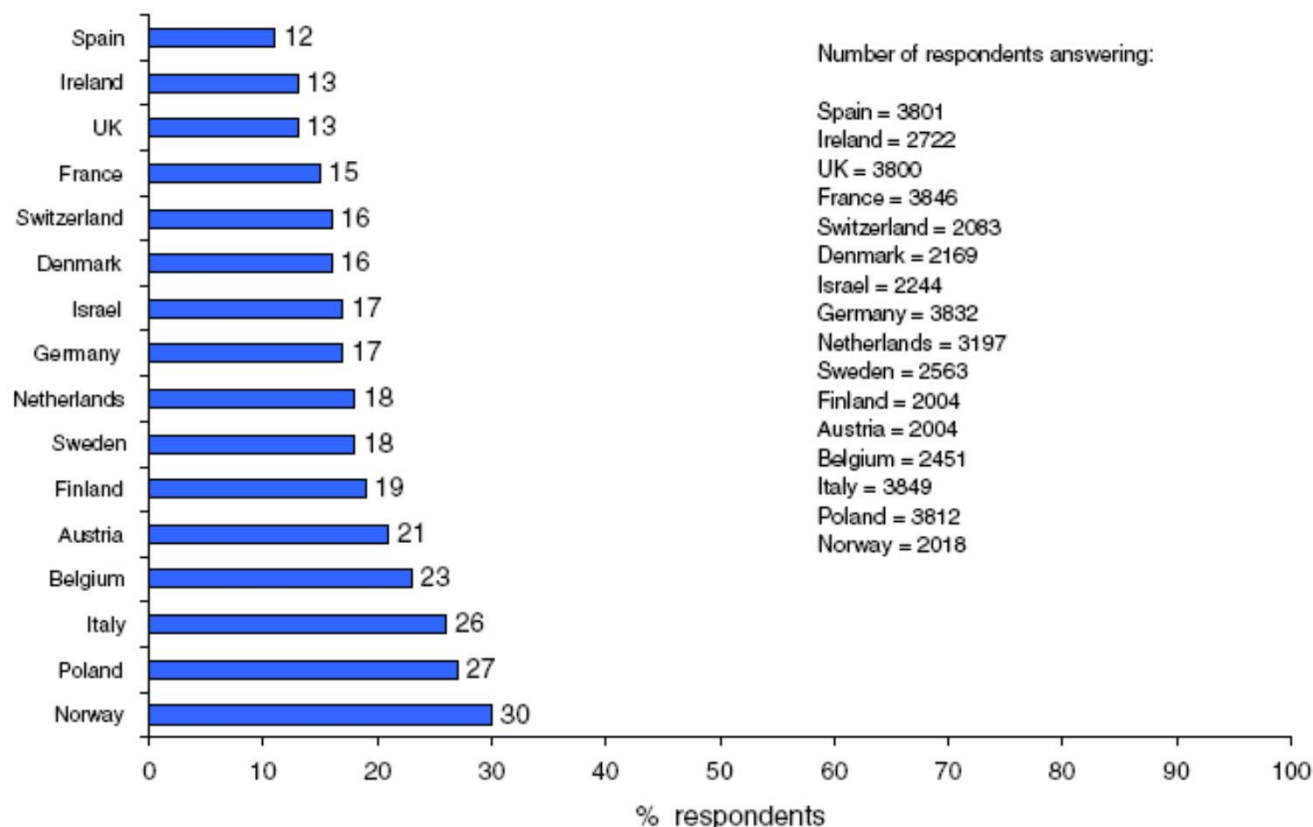


Innovative Medicines Initiative

On average, one out of every five Europeans suffer from chronic pain*

H. Breivik et al. / European Journal of Pain 10 (2006) 287-333

* Only including cases requiring treatment



EFIC® Symposium The societal impact of pain, Hamburg, Germany, 23rd September 2011



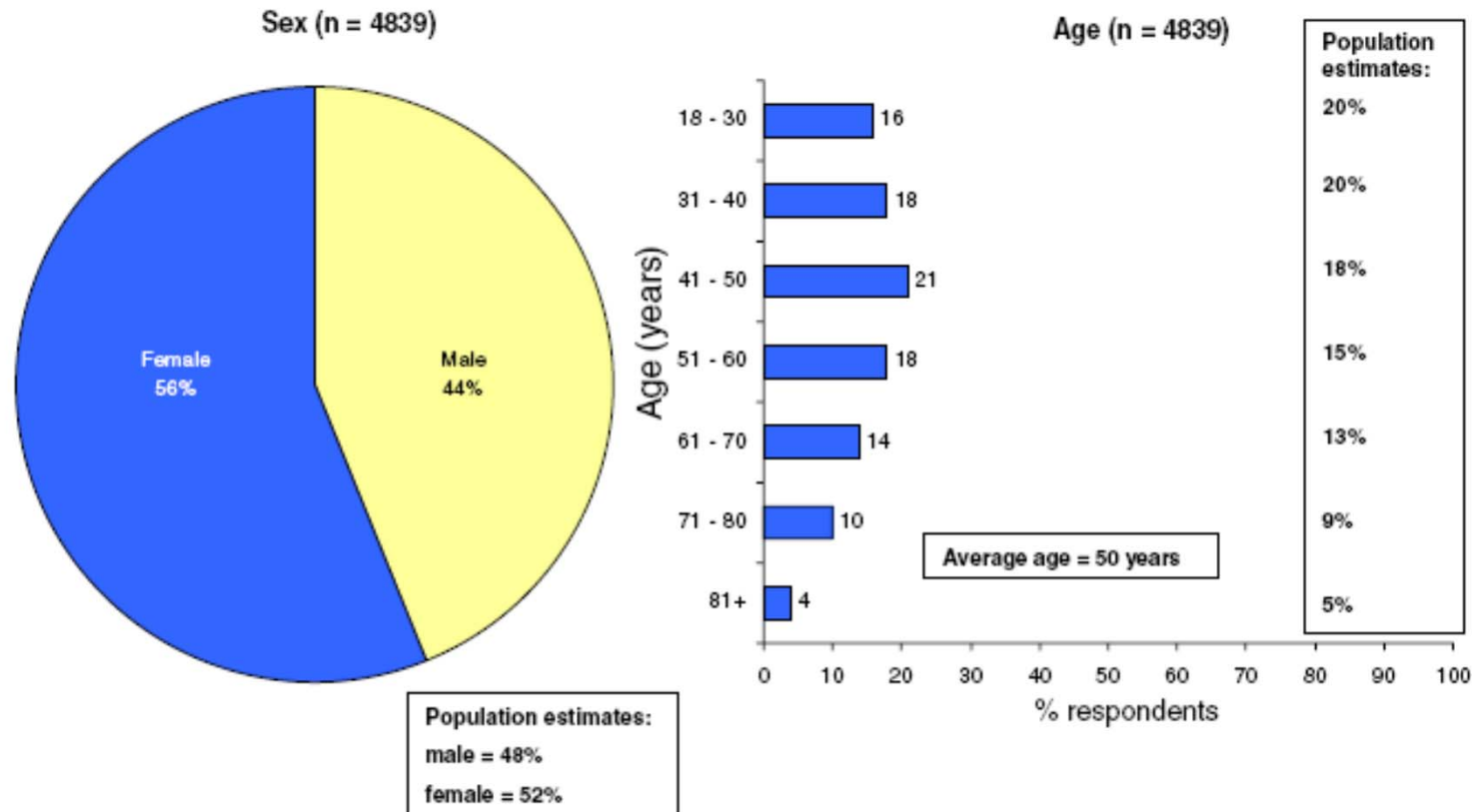
Demographics of Chronic Pain



Innovative Medicines Initiative

Chronic pain can affect anyone

H. Breivik et al. / European Journal of Pain 10 (2006) 287-333



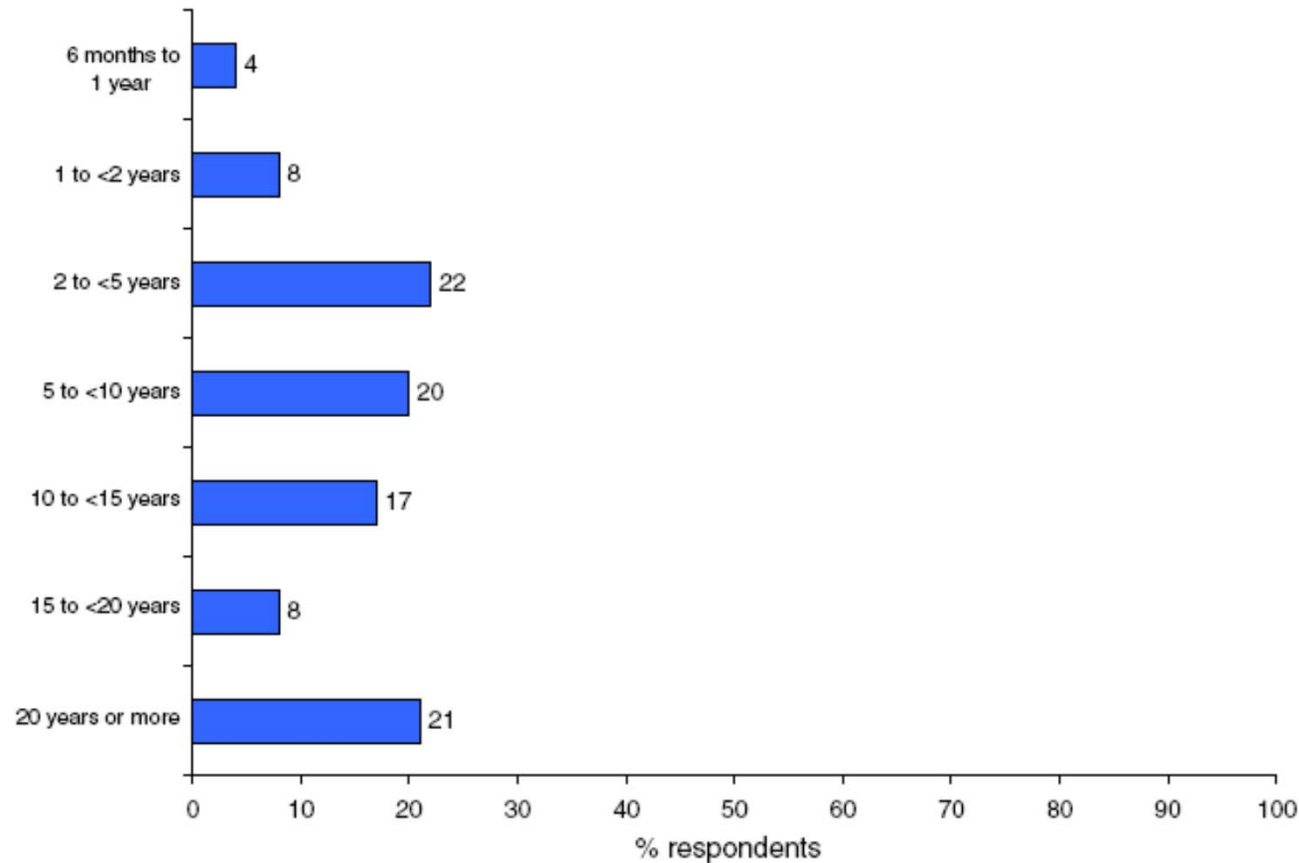
Duration of Chronic Pain



Innovative Medicines Initiative

In 21% of cases chronic pain lasts more than 20 years

H. Breivik et al. / European Journal of Pain 10 (2006) 287-333



*EFIC[®] Symposium The societal impact of pain, Hamburg, Germany,
23rd September 2011*



Severity of Chronic Pain

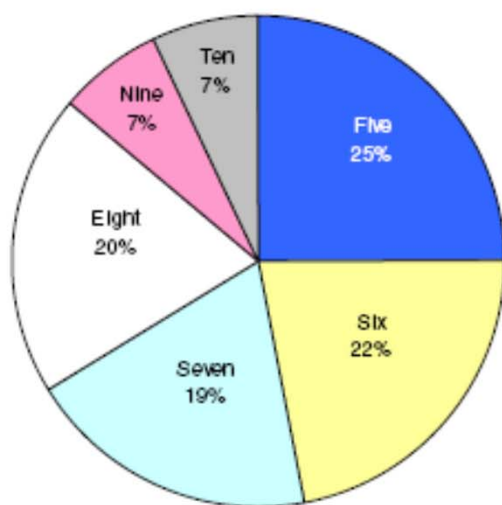


Innovative Medicines Initiative

In 31% of cases Chronic pain is defined as unbearable

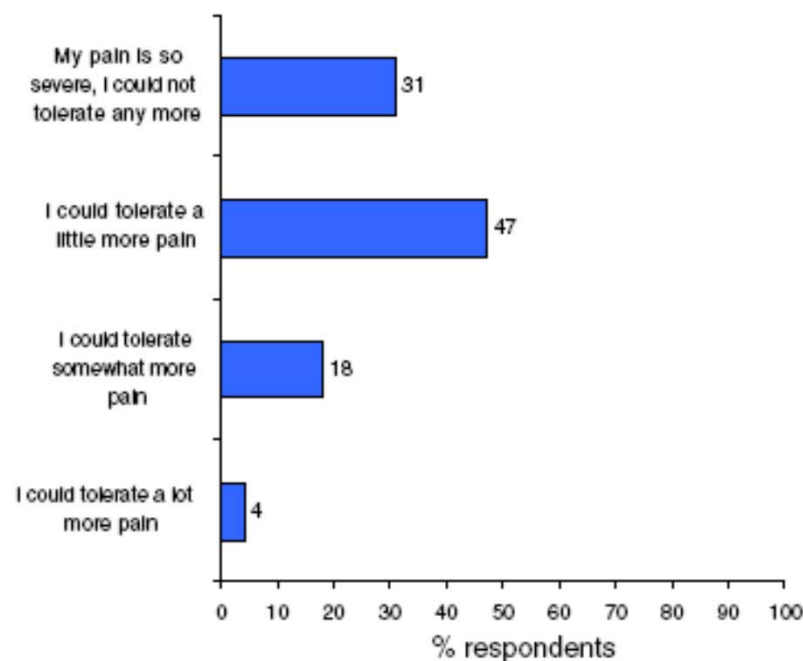
H. Breivik et al. / European Journal of Pain 10 (2006) 287-333

% respondents rating pain as 5-10 on a 10-point numerical rating scale¹
(n= 4839)



¹ Respondents with scores of 1-4 were not eligible to participate in the study

Tolerance level for more pain
(n= 4785)



EFIC® Symposium The societal impact of pain, Hamburg, Germany,
23rd September 2011



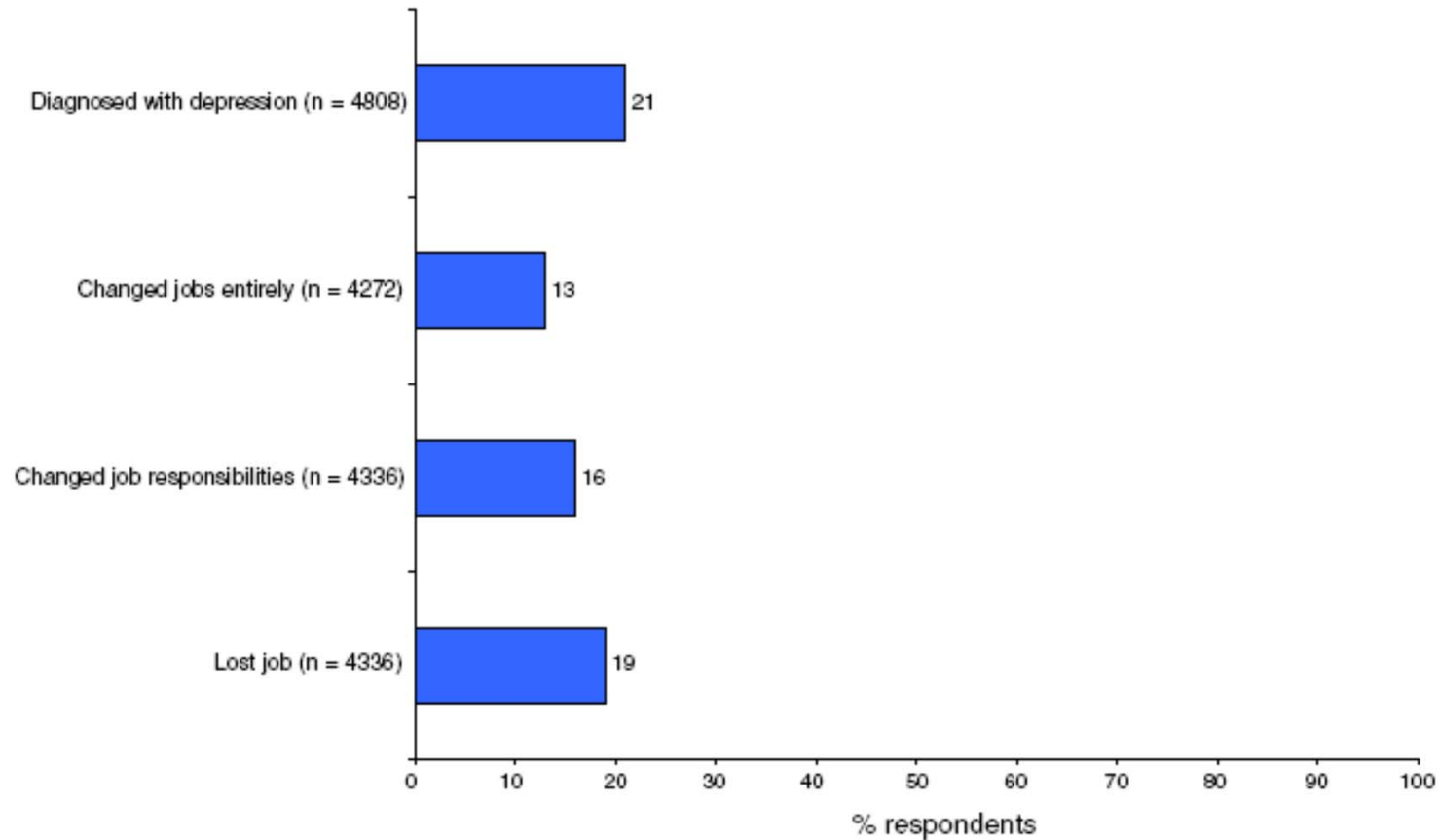
Chronic Pain Has Severe Consequences



Innovative Medicines Initiative

Chronic pain influence job perspectives and may lead to depression

H. Breivik et al. / European Journal of Pain 10 (2006) 287-333



EFIC[®] Symposium The societal impact of pain, Hamburg, Germany, 23rd September 2011



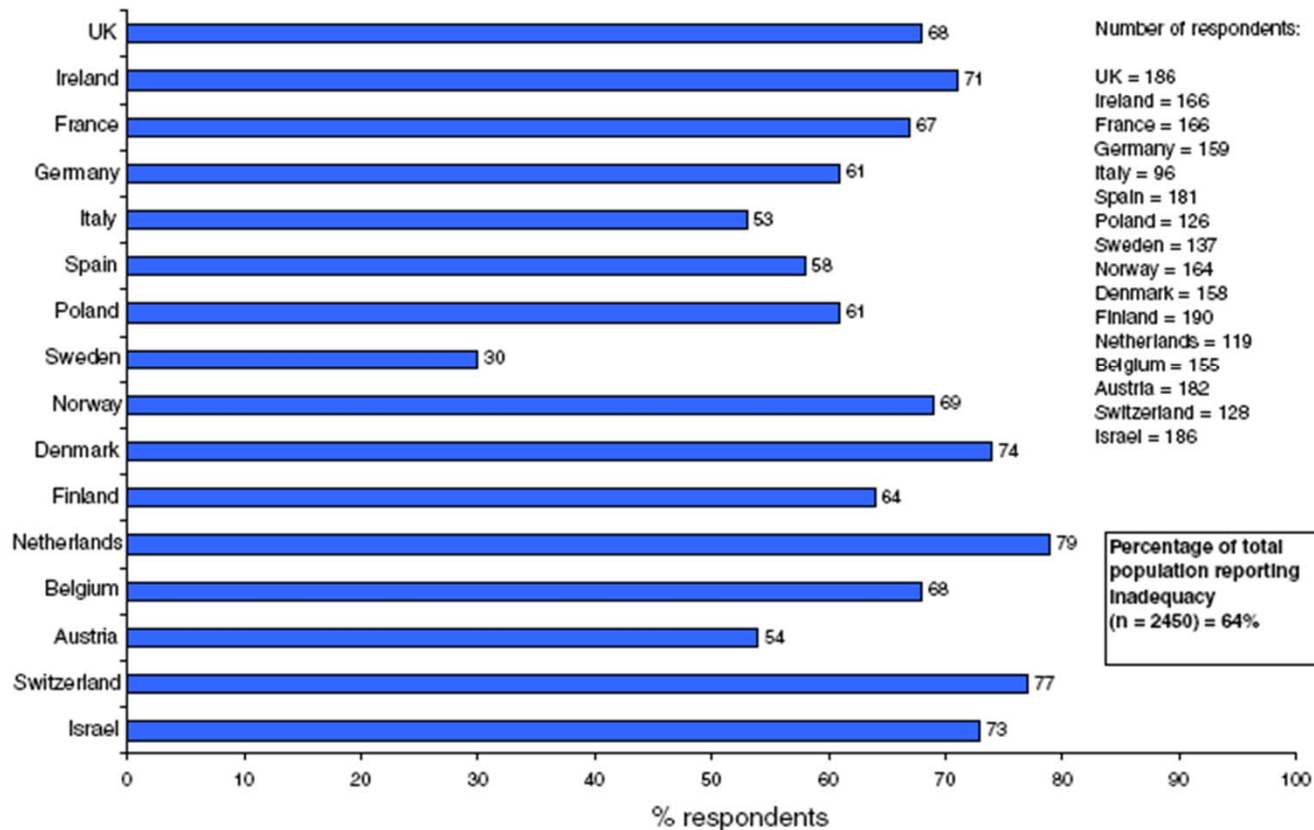
Chronic Pain Treatment is Inadequate



Innovative Medicines Initiative

Existing drug therapies are insufficient and a majority of patients withdraw from treatment due to lack of efficacy or subjective side effects

H. Breivik et al. / European Journal of Pain 10 (2006) 287-333



EFIC® Symposium The societal impact of pain, Hamburg, Germany, 23rd September 2011



Why Developing New Analgesics is Difficult



- Pain experience and pain-related problems are not always predictably related to the underlying cause
- Different forms of chronic pain have different underlying mechanisms.
- For personalised health care the right patient segment has to be identified
- The gap between animal behavioural models and humans has not been overcome
- Only recently has identification of novel targets and genes important in chronic pain become fairly easy



*EFIC® Symposium The societal impact of pain, Hamburg, Germany,
23rd September 2011*



IMI is the Largest PPP in Health Sciences



Innovative Medicines Initiative



€1 billion*
→



←
€1 billion*



Innovative Medicines Initiative

* Research performed by
EFPIA member companies

= *in kind* contribution

* IMI Research funding from FP7
Health Budget (total €6.1
billions)

for

Academia, SMEs, patients
organisations, Regulatory
Authorities, etc.



IMI Research Projects



EFIC® Symposium The societal impact of pain, Hamburg, Germany,
23rd September 2011



Euro pain

The EuroPain Project



In order to succeed in providing better medicines to patients we need to collaborate closely between Academic partners, Biotech SMEs and pharmaceutical companies

The ultimate goal of the project is to improve the pharmacological treatments against chronic pain and to reduce the burden of illness of very large groups of the European population.



*EFIC® Symposium The societal impact of pain, Hamburg, Germany,
23rd September 2011*



efpia

The EuroPain Project



London Pain Consortium

- King's College London (Managing Entity)
- University College London
- University of Oxford
- Imperial College London

German Neuropathic Pain Network

- Christian-Albrechts-Universitaet zu Kiel
- Ruprecht-Karls Universitaet Heidelberg
- Technische Universitaet Muenchen
- BG Universitätsklinikum Bergmannsheil GmbH
- Klinikum der Johann Wolfgang Goethe-Universitaet

Danish Pain Research Centre

- Aarhus University Hospital
- Region Hovedstaden
- University of Southern Denmark

EFPIA

- AstraZeneca (Coordinator)
- Boehringer Ingelheim
- Pfizer Limited
- Eli Lilly and Company Ltd
- Esteve S.A.
- UCB Pharma
- Sanofi-Aventis R&D
- Grünenthal

Total project cost: 18.5 MEUR

Timing:

Starting date: October 1, 2009

Duration: 60 months, ending Sept 30, 2014

SME:

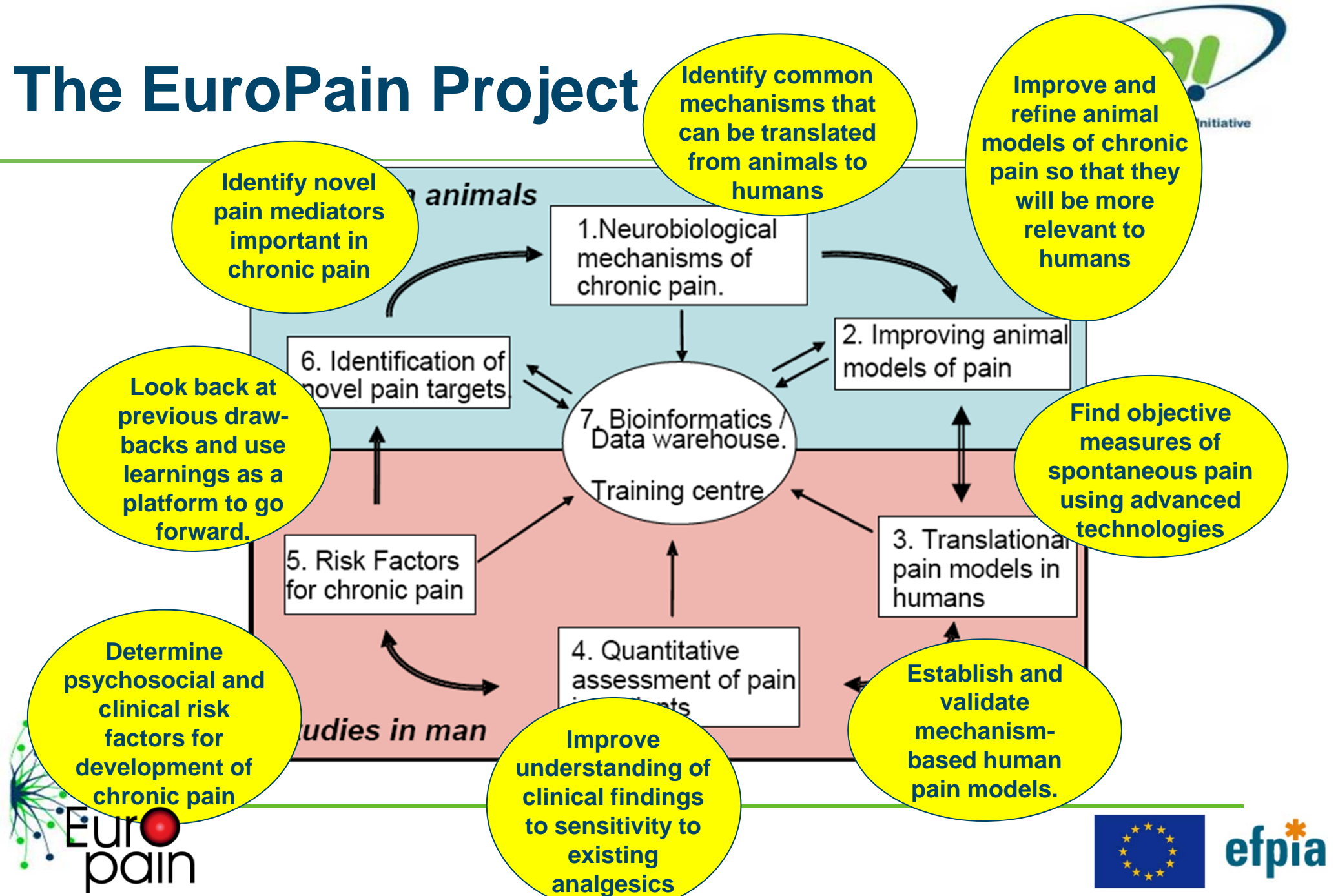
Neurosciences Technologies S.L.



*EFIC® Symposium The societal impact of pain, Hamburg, Germany,
23rd September 2011*



The EuroPain Project



The EuroPain Project: Some Achievements



- Using a standardised Quantitative Sensory Testing (QUAST) protocol a database has been developed of different measures in patients suffering neuropathic pain of different origins.

This will help identify potential underlying mechanisms of chronic neuropathic pain and differences in patients groups.

- A novel imaging technique based on magnetic resonance imaging (MRI) has visualised changes in the normal brain resting state network (RSN) in patients with low-back pain compared with healthy controls.

This can be used to predict the intensity of pain experienced by the patients.

- A new model for cold hypersensitivity has been developed in healthy human volunteers, with a similarity with the sensory profile for chemotherapy-induced pain.

This model can be used for faster and more efficient testing of novel treatments



The EuroPain Project: Bridging the Gap between Animal Models and Humans



RESEARCH ARTICLE

Sci. Transl. Med. 3, (2011)

PAIN

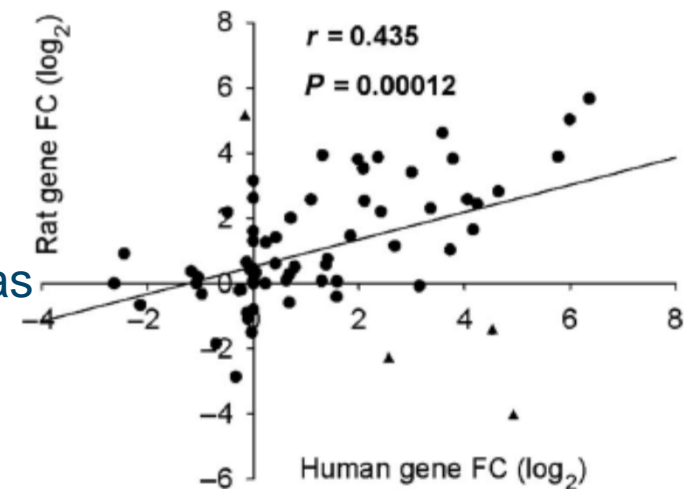
CXCL5 Mediates UVB Irradiation-Induced Pain

John M. Dawes,¹ Margarita Calvo,^{1*} James R. Perkins,^{2*} Kathryn J. Paterson,^{1*}
Hannes Kieseewetter,¹ Carl Hobbs,¹ Timothy K. Y. Kaan,¹ Christine Orengo,²
David L. H. Bennett,^{1,3} Stephen B. McMahon^{1†}

A novel translational study from scientists of the EUROPAIN team has revealed the chemokine CXCL5 as an important mediator of the inflammatory pain that occurs after sunburn.

In a role reversal for humans and animal models, CXCL5 was first implicated through expression profiling experiments in healthy volunteers.

Subsequent work in rats showed that CXCL5 propels the painful inflammatory response that follows a burn.



EFIC® Symposium The societal impact of pain, Hamburg, Germany,
23rd September 2011



The EuroPain Project: the Benefit for Europe



Innovative Medicines Initiative



- Better pain treatment will reduce the socio-economic burden for patients and society



- Improved success rate in drug development will give EFPIA members and Biotech SMEs better possibility to contribute to economic growth in Europe.



Euro
pain



efpia



Innovative Medicines Initiative

Questions?

elisabetta.vaudano@imi.europa.eu