NIH Programs for Developing and Testing Pain Treatments

HEAL Partnership Committee (HPC)
Face to Face
August 1, 2019

Walter J. Koroshetz, MD
Director, National Institute of Neurological Disorders and Stroke, NIH
HEAL Programs for Pain Cover the Research Spectrum

- Discovery
  - Acute to Chronic Pain Signatures
  - Discover and Validate Novel Targets
- Preclinical Development
  - Preclinical Screening Platform
  - Small Molecules and Biologics Development
  - Device Development
  - Discovery and Validation of Biomarkers, Biomarker Signatures, and Endpoints
  - Data & Asset Sharing Partnership
  - Early Phase Pain Investigation Clinical Network
  - Back Pain Research Consortium
- Clinical Trials
  - Hemodialysis Pain Management
  - Pain Effectiveness Research Network
  - Pragmatic and Implementation Studies for the Management of Pain
- Implementation/Dissemination
HEAL Pain Programs Engage Multiple NIH Institutes and Centers

- National Institute of Arthritis and Musculoskeletal and Skin Diseases
- National Institute of Diabetes and Digestive and Kidney Diseases
- National Institute of Nursing Research
- National Center for Complementary and Integrative Health
- National Institute of Dental and Craniofacial Research
- National Institute of Biomedical Imaging and Bioengineering
- National Institute on Drug Abuse
- National Cancer Institute
- National Institute on Aging
- National Institute of Neurological Disorders and Stroke
- Eunice Kennedy Shriver National Institute of Child Health and Human Development
Examples of funded projects include:

- Novel GPCR reported to be increased in spinal cord after nerve injury
- Modulating an epigenomic target
- Tissue metalloproteinase
- Astrocyte secreted synaptogenic protein
- VegF signaling
- Modified Kappa Opioid Receptor agonist
- Role of macrophages in development of chronic pain in cord
- Role of apoA-1 in chronic pain.
- Twik-related spinal cord K+ (TRESK) channel in migraine
- DBS for medically refractory pain
- Plus more coming soon...
Examples of funded projects include:

• Auto Abs to predict risk of neuropathic pain after spinal cord injury
• EEG and TMS cortical biomarker signature for pain in TMD
• Microneuromas as a biomarker for neuropathic corneal pain
• IL-1 family cytokine activity (plasma) and associated brain endogenous opioid function (11C-CFN Positron Emission Technology) in post op pain.
• Clinical and Neuroimaging predictors of persistent post traumatic headache
• Plus more coming soon...
Examples of effectiveness trials cover pain conditions such as:
• Perioperative pain
• Chronic Overlapping Conditions
• Musculoskeletal pain
• Chronic pain
• Hip/Knee OA
• Cancer pain: GI & Lung
• Post-caesarian pain
• Low back pain
• Fibromyalgia

...and interventions such as:
• Acupuncture
• Physical therapy
• Telehealth CBT
• Coached self-management
Examples of clinical research include:

- **Biomarkers** of chronic low back pain including liquid biopsies, wearables, imaging and better ways to evaluate patients.
- **Treatments** of chronic low back pain including support devices, non pharmacologic pain management techniques and technologies.
HEAL Programs You’ll Hear About Today

Discovery
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- Discover and Validate Novel Targets

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Clinical Trials
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Implementation/Dissemination
- Back Pain Research Consortium
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- Pain Effectiveness Research Network
- Pragmatic and Implementation Studies for the Management of Pain

NIH National Institute of Neurological Disorders and Stroke
Both programs address needs in the pathway of developing non-addictive therapies for pain

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<tr>
<th>Early Phase Pain Investigation Clinical Network (EPPIC-Net)</th>
<th>Preclinical Screening Platform for Pain (PSPP)</th>
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<tbody>
<tr>
<td>• Incentivize, accelerate early phase trials for therapeutics and devices</td>
<td>• Offer academia and industry an efficient, rigorous screening resource</td>
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<tr>
<td>• Focus on well-defined pain conditions with high-unmet need</td>
<td>• Generate high quality efficacy data in models relevant to human pain conditions</td>
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<td>• Reduce the time to start, enroll, run, and complete trials</td>
<td>• Provide expertise to participants from the research community and industry at no cost</td>
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Successful programs will incentivize the academic and industry communities to re-invest in pain therapeutics development
Past challenges of animal models of pain

Need for novel non-opioid pain therapeutics identified

What can NINDS do to facilitate development of non-opioid therapeutics/devices?

Preclinical Screening Platform for Pain (PSPP)

Summer 2017

Jan. 30-31, 2019