

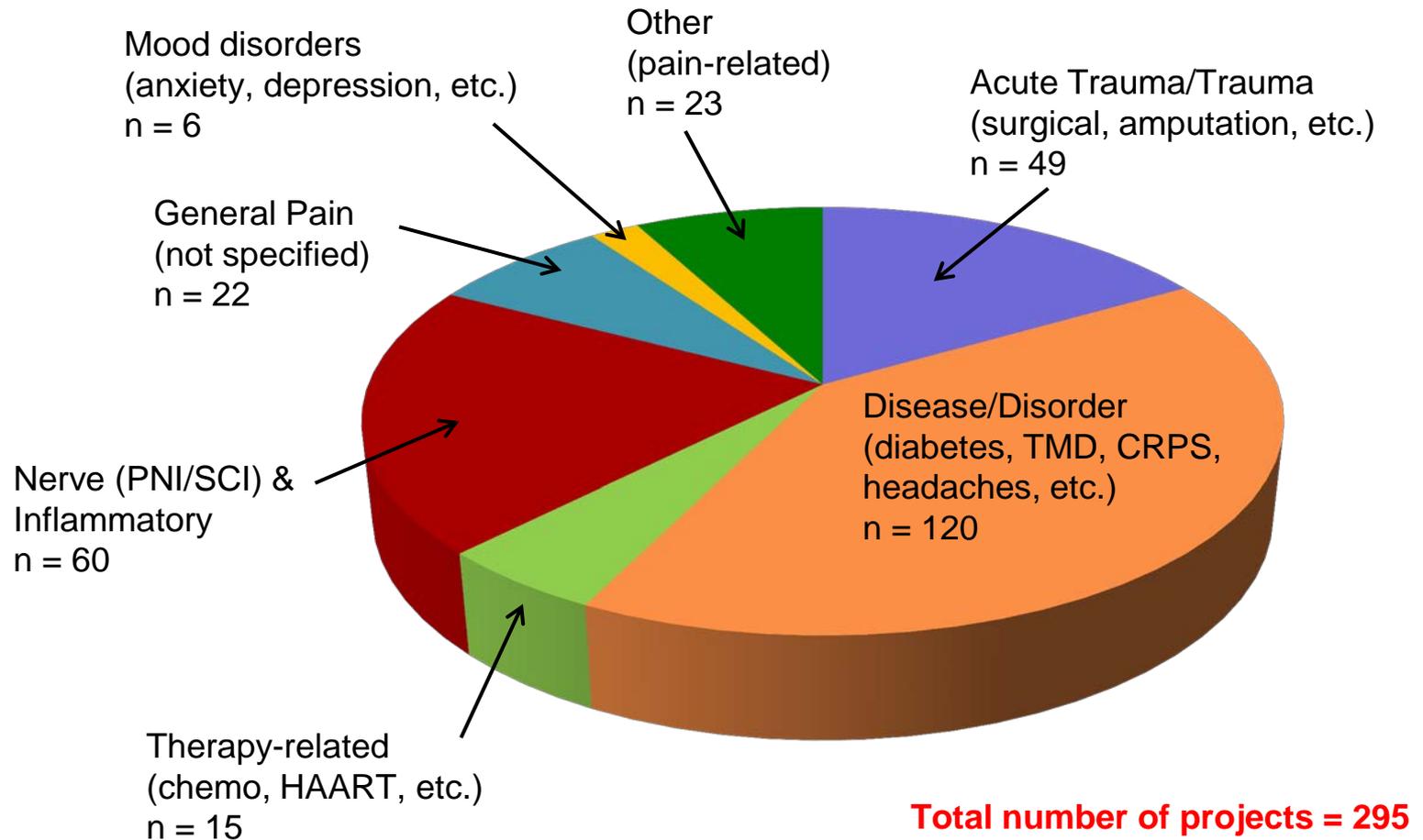
# Trauma, Headaches and Neuropathic Pain

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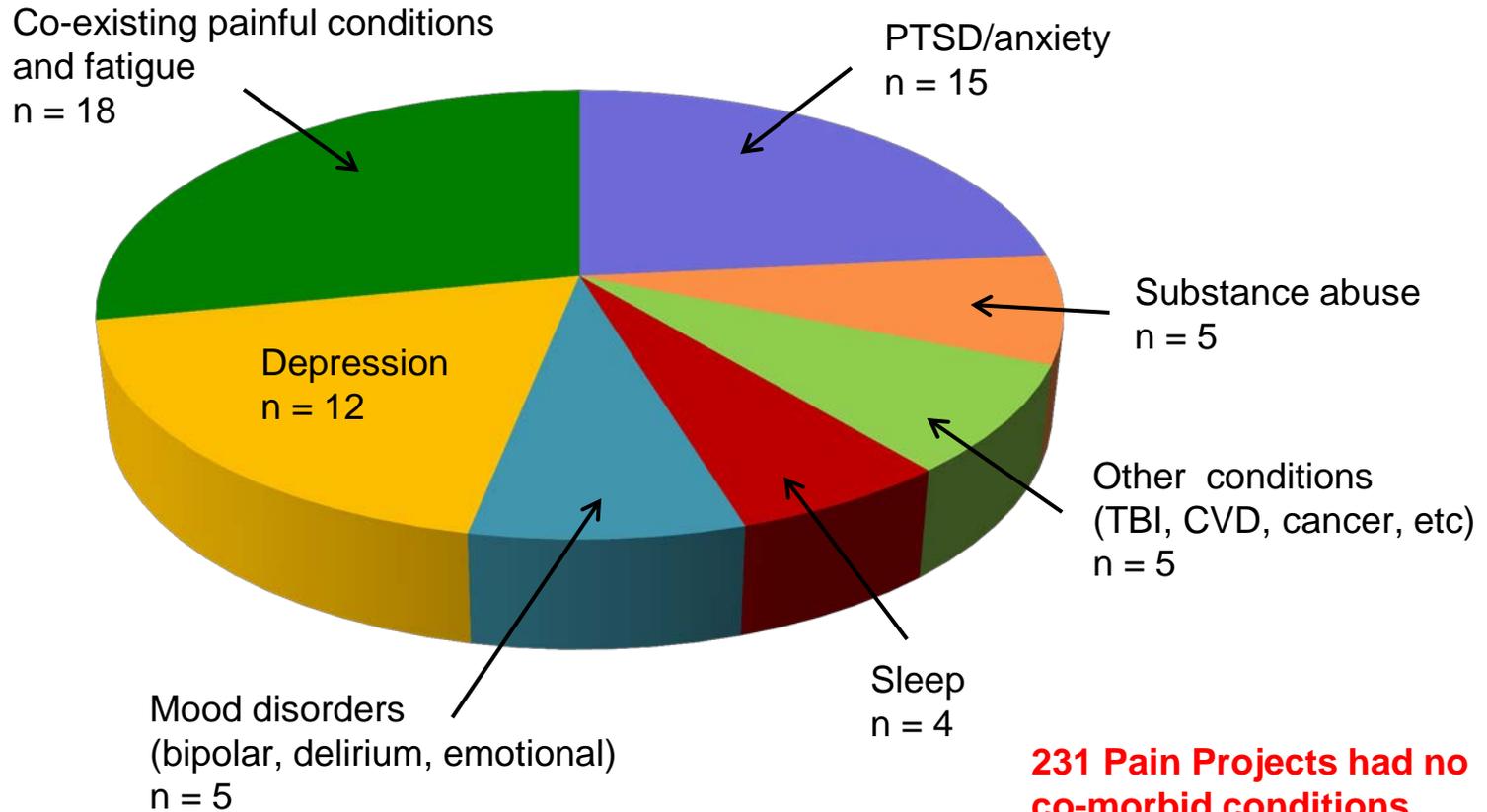
# Portfolio Overview and Analysis

- All funded projects from the DoD, NIH and DVA on subtopics: all neuropathic pain, pain and trauma, pain and other conditions, all headaches, and acute/subacute pain.
- **Total number of projects = 295 (no duplicates)**
- Analysis – DoD and VA abstracts and applications from VA and NIH (via QVR).
  - a. Etiology of painful condition (e.g. disease, disorder, pain model)
  - b. Co-existing conditions (e.g. other painful conditions, mood disorders, etc.)
  - c. Approach – mechanistic, pharmacological, tech devt, etc.
  - d. Intersection with other portfolio pain areas
  - e. Identification of agency interests

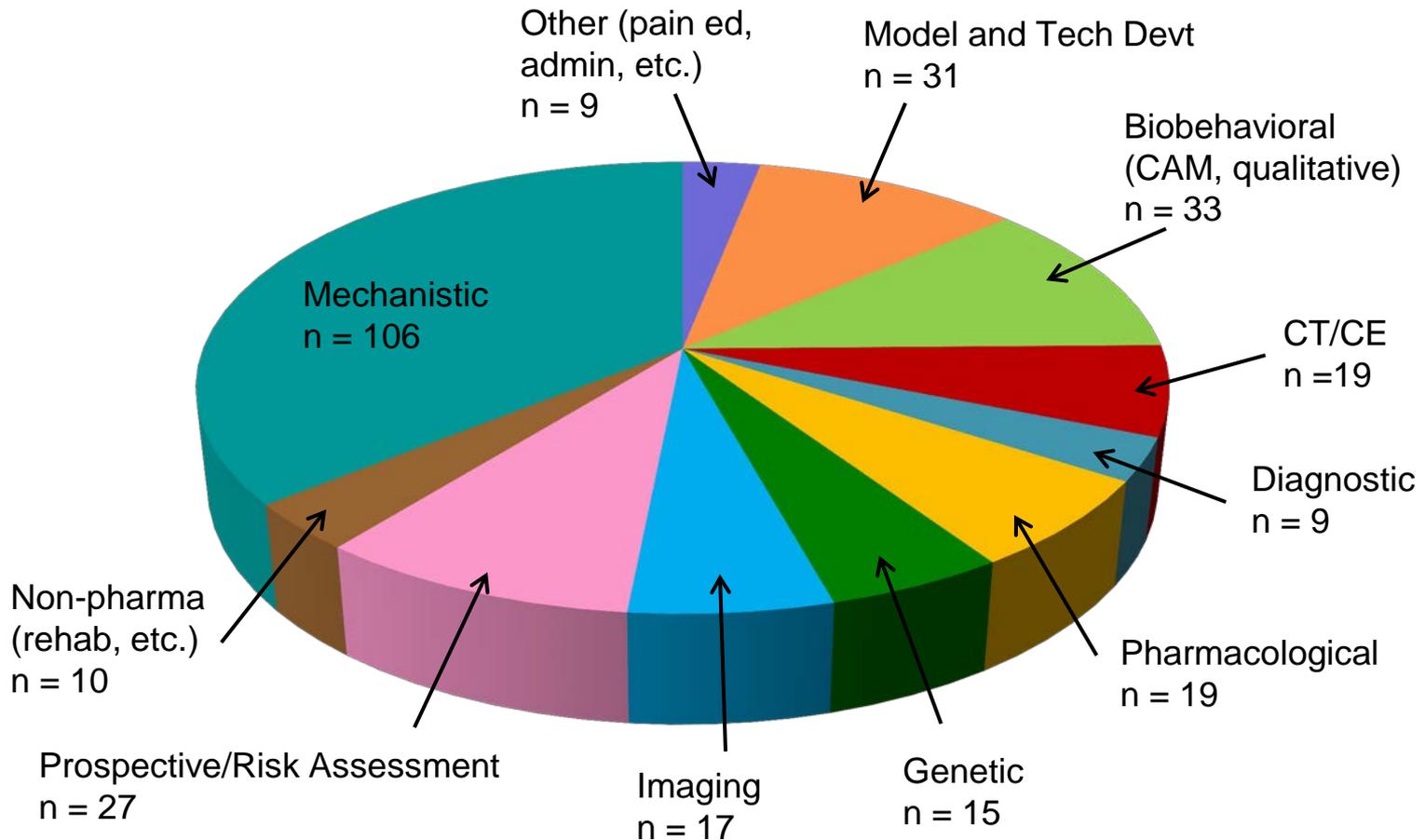
# Trauma/Headaches/NPP by Etiology



# Trauma/Headaches/NPP by Co-morbidities



# Trauma/Headaches/NPP by Approach



# Shared Interests and Opportunities to Collaborate

- Opiate use and addiction – NIDA/DoD/VA
- Complementary methods to treat chronic pain – NCCAM/DoD/VA (NIDA/NCCAM/VA working on joint RFA)
- Mental health conditions and pain – NIMH/DoD/VA
- Mechanisms underlying transition from acute to chronic pain – NINDS/NIDCR/VA
- Musculoskeletal pain (LBP, OA, TMD, etc.) – NIDCR/NINDS/NIAMS/VA
- Peripheral nerve injury – NIDDK/NINDS/DoD/VA
- Headaches and migraines – NINDS/NIDCR/VA
- Trauma and surgical pain – NINDS/DoD/VA
- Technology devt. and non-pharma (estim, etc.) – NINDS/DoD/VA
- Genetics and phenotyping – NIDCR/NINDS/NIDDK/VA
- Cancer and chemotherapy-induced pain – NCI/NINDS/NIDCR

# Relevance to Other Painful Conditions

## Shared mechanisms

1. SCI and PNI pain – **DRG and glia** (aberrant sensory sprouting, BDNF, ion channels, inflammation, glutamate)
2. LBP, CRPS, migraines, conduct disorder (pain empathy) – **CNS plasticity** (cortical thickness, insular ctx, ant. cingulate ctx, rostral ventromedulla)
3. Burns, small fiber neuropathy, SCI, PNI, surgical – **channels** (NaV, CaV and KV, TRPV)

## Unique treatment strategies

1. Virtual reality – phantom limb, burns/surgical, trauma
2. Vaporized cannabis – SCI
3. Magnetoencephalography – migraine
4. Hypnotherapy – pre-surgical

## Therapy development

1. Drug delivery – microspheres, viral vectors, etc. to deliver drugs directly to site
2. Nerve block strategies – acute traumatic pain

# Gaps & Opportunities: Research areas needed or untapped

- Mild TBI and pain – headaches and relation to FM, IBS
- Mental health conditions and pain – better understanding of how one influences the other
- Genetics and phenotypes – why is it that some individuals are more prone to developing chronic pain following injury vs. others?
- Preventative – how to control the transition from acute to chronic pain and its secondary consequences (e.g. depression, PTSD, etc.)?
- Sex, race, and age differences in pain perception, transition, and response to treatment