Mission statement: To combine innovative approaches in an environment that is fully integrated and focused on compulsive behaviors that disproportionally impact our border community. Our long-term goal is to help develop more effective treatments for addiction in vulnerable populations in the context of training programs that promote diversity.
High rates of substance abuse among Hispanics disproportionately fuels health disparities in our border region.

Solving the complex problem of addiction requires the integration of interdisciplinary teams working at the forefront of their disciplines.

Our primary project focuses on nicotine. During abstinence, women experience greater anxiety, depression, craving, and cortisol release. Also, women display lower quit rates and pharmacological approaches that target withdrawal are less effective in women.

Our work in rodents has shown that during withdrawal, female rats display greater stress responses. However, there is a knowledge gap in our understanding of the mechanisms that enhance withdrawal in females versus males.
Behavioral neuroscience approach

- **Behavior:**
  - Self-administration
  - Place preference
  - Nicotine dependence

- **Biological changes:**
  - Neural mapping
  - Optogenetics
  - Neurochemistry
  - Gene expression
  - Protein markers

- Nicotine reward:

- Nicotine withdrawal:

- Genetic or protein changes:

- Neurotransmitter levels:

Texas Tech
- Brain imaging
- Brain bank
**Scientific Premise:**

Stress promotes nicotine use in females.

- Males
  - Cease: Stress
  - Relapse: Nicotine Withdrawal
- Females
  - Stress
  - Relapse: Ovarian Hormones (E2)


**Key Data:**

Females display greater IPN activation, an effect that was blocked by a CRFR1 antagonist.

<table>
<thead>
<tr>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cessation</td>
<td>Stress</td>
</tr>
<tr>
<td>Relapse</td>
<td>Relapse</td>
</tr>
</tbody>
</table>

**Technologies:**

- Behavior: Nicotine Vapor
- Self-administration
- Anxiety-like behavior

**Neuroscience:**

- Neural Mapping
- Neurochemistry

**Gene transfer technology**

**Team:** O’Dell, Khan, Mendez

Post-docs, Graduate Students, Undergraduates

**Scientific Premise:**

- Females display greater IPN activation, an effect that was blocked by a CRFR1 antagonist.

**Key Data:**

- Male: Saline
- Female: Saline
- Male: Nicotine
- Female: Nicotine
- Male: Nicotine + CRFR1 antagonist
- Female: Nicotine + CRFR1 antagonist

**Technologies:**

- Behavior: Nicotine Vapor
- Self-administration
- Anxiety-like behavior

**Neuroscience:**

- Neural Mapping
- Neurochemistry

**Gene transfer technology**

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Vole social defeat: A preclinical model to study the neurobiology of depression

Stress is a risk factor for mood-related illnesses, wherein women represent the majority of those afflicted with depression. To address this issue at the preclinical level, we modified the traditional *social defeat model of stress* to include female and male prairie voles – since they display *human-like social bonding behavior*. This approach will generate a translational model that will allow us to study the sexually dimorphic nature of mood-related illnesses, and the development of more effective pharmacological treatments.

**Major outputs:** Vole project

Sam Castillo
Graduate Student

**Social defeat test**

<table>
<thead>
<tr>
<th>Blood Collection</th>
<th>Blood Collection</th>
<th>Tissue Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>PD 60</td>
<td>PD 61- PD 75</td>
<td>PD 76- PD 82</td>
</tr>
<tr>
<td>PD 83</td>
<td>Social Defeat</td>
<td>Behavioral Tests</td>
</tr>
</tbody>
</table>

Post-social defeat test
- Open Field Test
- Light/Dark Box
- Elevated Plus Maze
- Social Interaction
- Forced Swim Test
- Tail Suspension Test
- Splash Test
- Novelty Suppressed Feeding
Major outputs: Training diversity

- Leaky pipeline

- Non-minority (White, Asian)
- Minority (African American, Hispanic, American Indian/AN)

- R01
- Diversity Supplement Program
  - Diversity Supplement Workshop
  - Blueprint F99/K00
  - NRSA F31 (Diversity)
  - NIDA/NIAAA Diversity R25
  - Div Travel Award

- NIDA Diversity Scholars Network
  - Diversity Supplement Program
  - Div Supplement Workshop
  - MOSAIC K99/R00
  - Brain K99/R00
  - Brain F32
  - NIDA/NIAAA Diversity R25
  - Div Travel Award

- NIDA Summer Research Internship Program
  - NIDA/NIAAA Diversity R25
  - NIH Blueprint ENDURE
  - Diversity Summer R25
  - NIGMS Diversity Programs
Major outputs: Training diversity

• All research is supported by training grants:

  SMART:MINDS-Undergraduate Training Program
  VIDA:CARTT-Post-doctoral Fellowship Program

• We anticipate new training grants that foster graduate student training
What is the percentage of awardees from Latinx background in NIH grant awards?
Systemic approach to enhancing diversity in addiction

Individual

Institution

Scientific Community & Stakeholders