

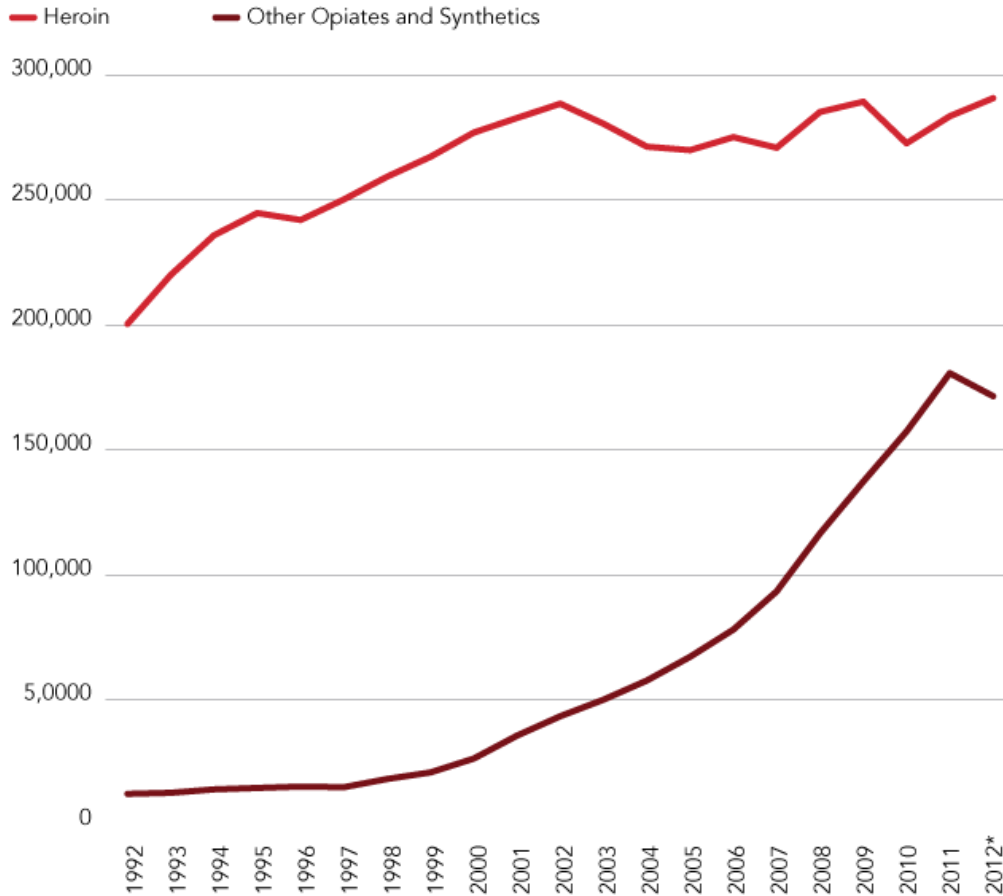
The opioid epidemic: How what we already know can help us

Howard Gutstein, MD
Department of
Anesthesiology
University of Pittsburgh

Painkillers And The Heroin Market

A growing number of people are using heroin in recent years, in part because it can be cheaper and easier to find than opioid painkillers purchased on the black market. **Most heroin users were first hooked on prescription opioids**, which generated \$11 billion in 2010 for the pharmaceutical industry.

Substance abuse treatment facilities admissions by primary drug



*2012 data for Mississippi, Pennsylvania, and West Virginia are not available.

4 out of 5

new heroin users have abused painkillers.

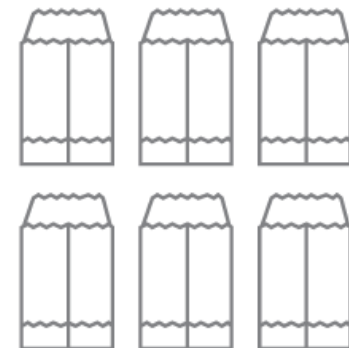


A Cheaper High

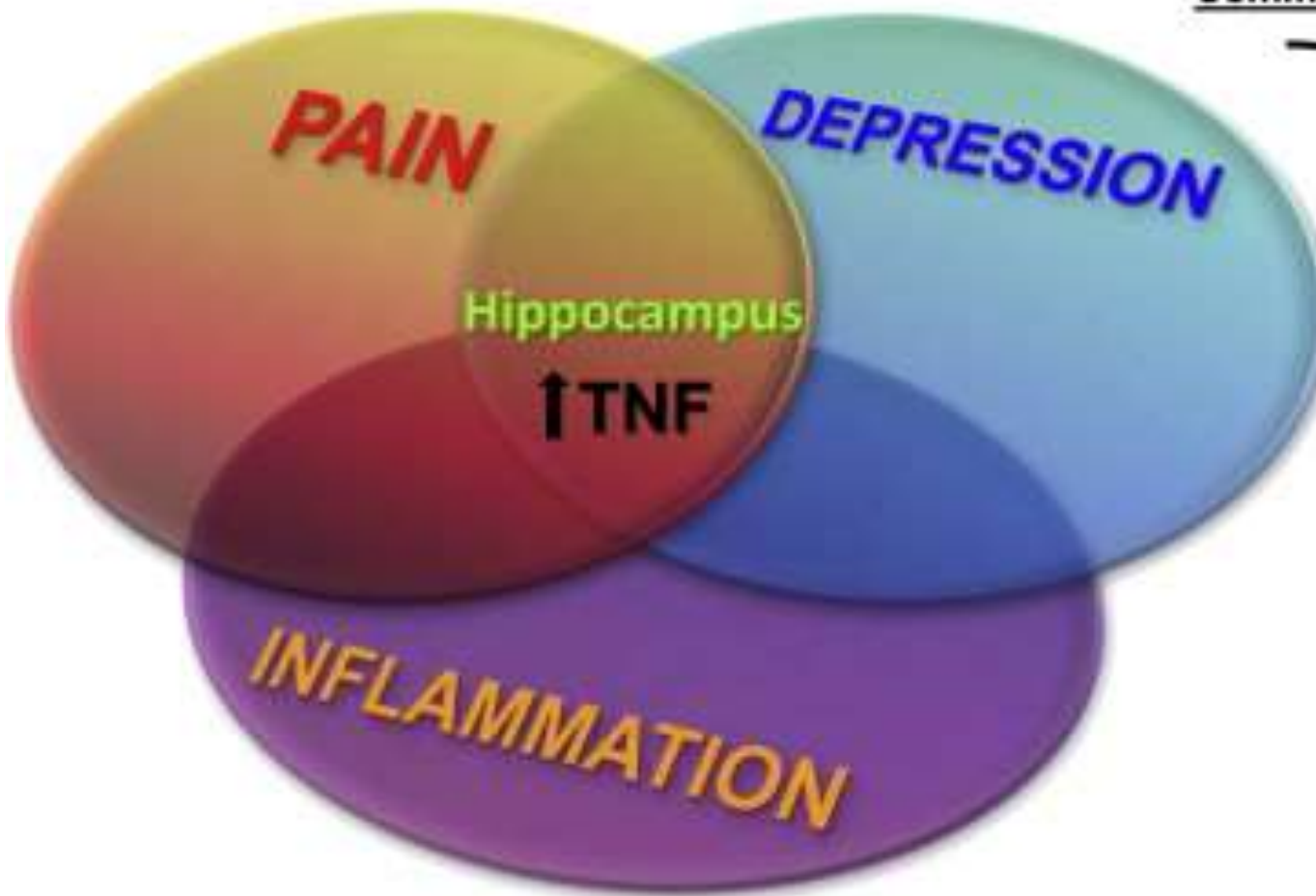
\$30 can buy one oxycodone pill on the street in New York...



or six hits of heroin.



Commonalities of Disorders



ANATOMY:

Anterior Cingulate Cortex
Prefrontal Cortex
Hippocampus
Amygdala
Thalamus

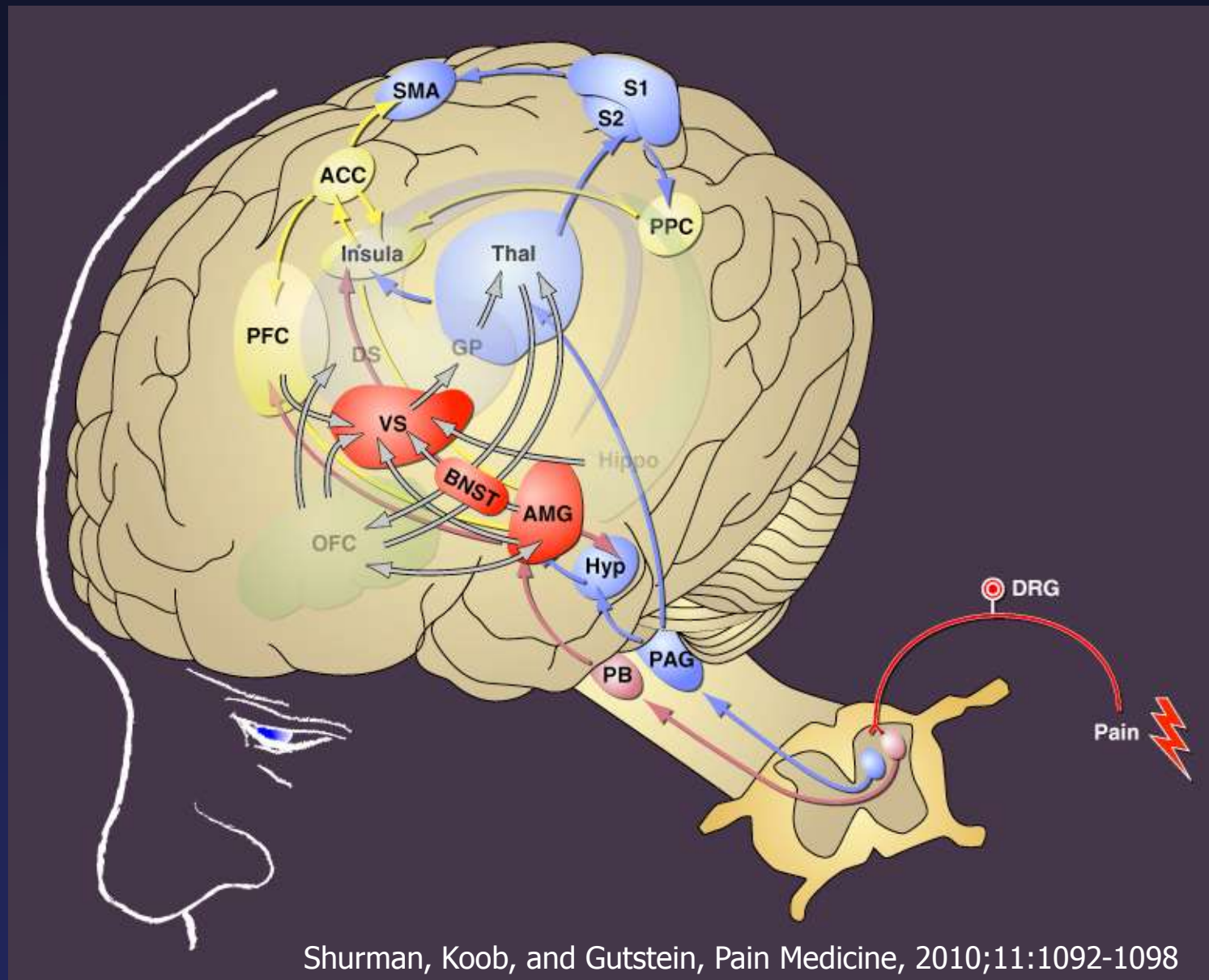
MOLECULAR DETERMINANTS: **Dysregulated Neurotransmitters**

Serotonin
Dopamine
Norepinephrine
Acetylcholine
Glutamate
GABA

Altered Cytokine Profile

Increase proinflammatory cytokines (TNF, IL-1, IL-6)
Decrease antiinflammatory cytokines (IL-4, IL-10)

Neurobiological Circuitry of the Overlap of Pain and Addiction



The dark side of opioids





NAM National Academy
of Medicine
ANNUAL MEETING 2017

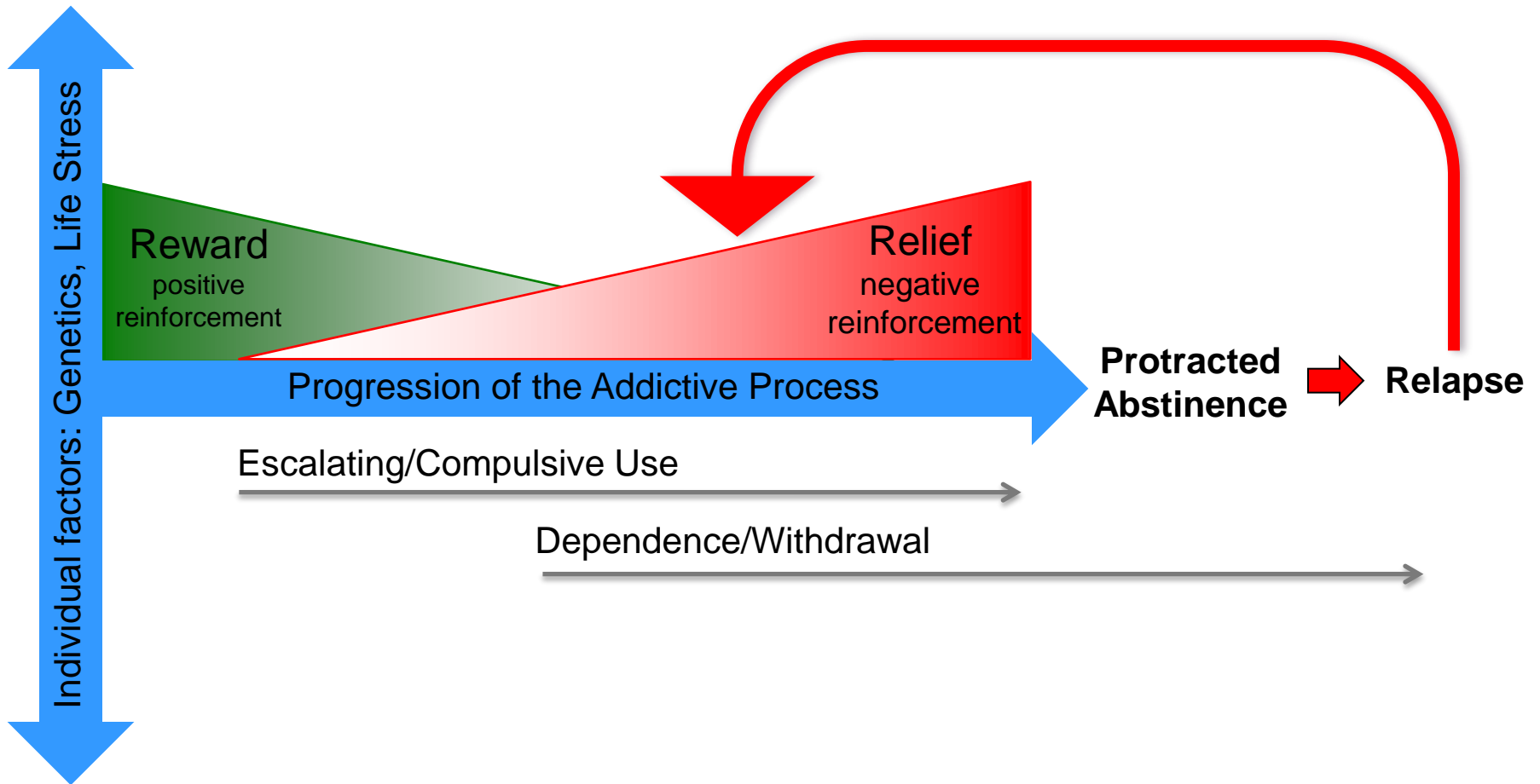
Developmental Neurosciences: Do We Know Enough to Prevent or Reverse Major Behavioral Disorders?



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Developmental Neurosciences: Do We Know Enough to Prevent or Reverse Major Behavioral Disorders?

Etiology of Addiction



FDA Takes Important Steps to Stem the Tide of Opioid Misuse and Abuse

Posted on [September 28, 2017](#) by [FDA Voice](#)

By Scott Gottlieb, M.D.

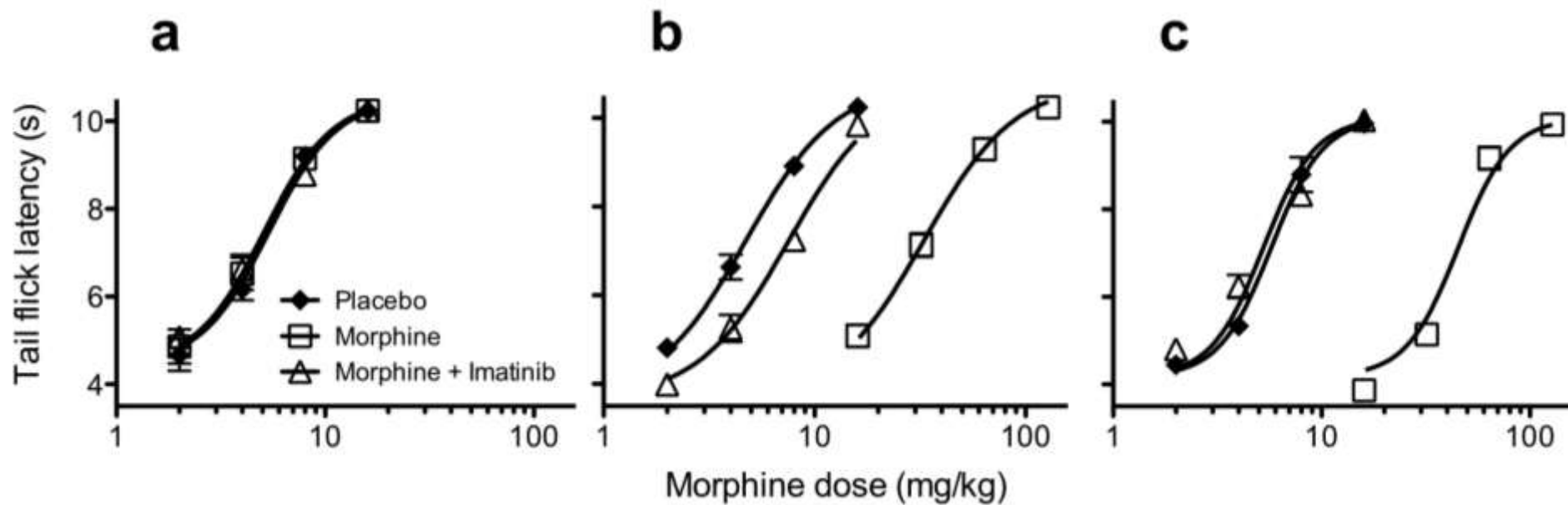
TURN
THE
TIDE



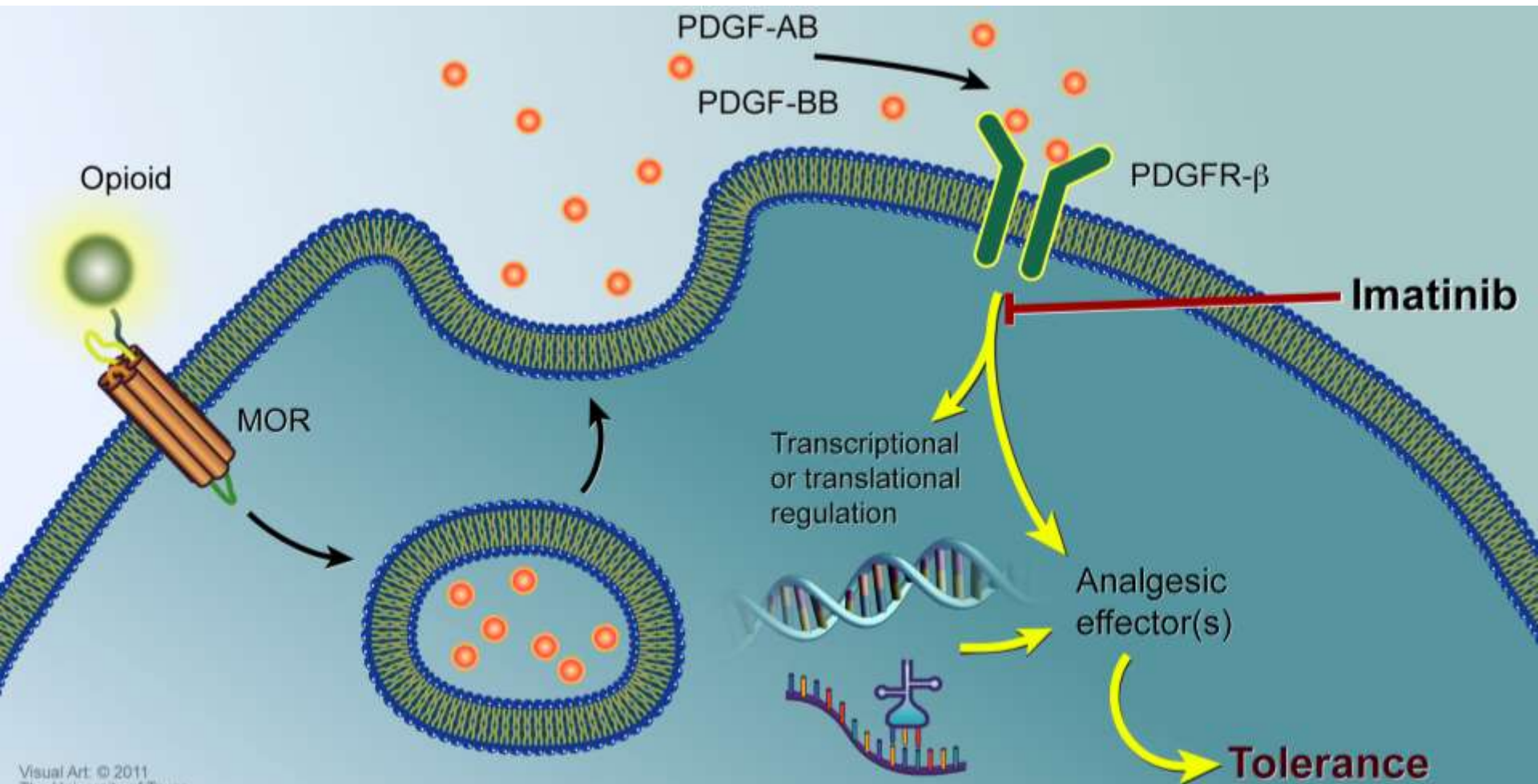
THE SURGEON GENERAL'S
CALL TO END THE OPIOID CRISIS



Imatinib reverses opioid tolerance in rats

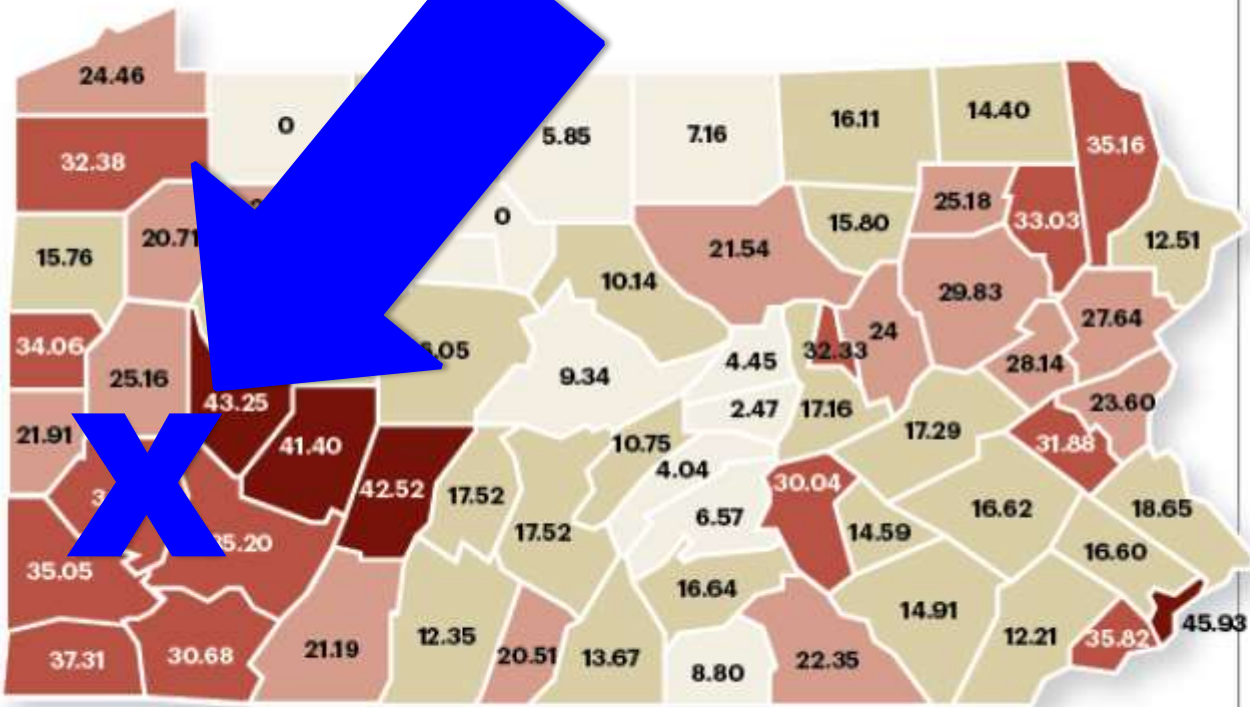


Proposed mechanism of tolerance inhibition



STATE OF EMERGENCY

Rate of drug-related overdose deaths per 100,000 people in Pennsylvania counties in 2015



Overdose deaths per 100,000 people

0-9	10-19	20-29	30-39	40-46
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PENNSYLVANIA CORONER DATA, WWW.CENSUS.GOV

BY THE NUMBERS

QUIET EPIDEMIC

Sobering facts about substance abuse

53%

Percentage of overdose deaths in Pennsylvania in 2015 in which an opioid was found in toxicology test results

No. 3

Where Pennsylvania ranked among all U.S. states in the number of opioid deaths in 2014; only California and Ohio had more

6

The number of counties in western Pennsylvania in the top 10 of those in the state with the highest drug-related death rates per 100,000 people