

***IN VITRO* PHARMACOLOGICAL**  
**CHARACTERIZATION OF RECENT**  
**NON-FENTANYL SYNTHETIC OPIOIDS**



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**CHARACTERIZATION OF RECENT**  
**NON-FENTANYL SYNTHETIC OPIOIDS**

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- The materials contained in this presentation are for educational purposes only.
- The opinions expressed in this presentation are solely those of the presenter.
- There are no financial or commercial interests to disclose.

# Opioids monitored by the EMCDDA EU EWS, 2019-2021



2019

2020

2021

2022

Piperidyl-  
thiam-  
butene

Furanyl  
UF-17

Etazene

Nortilidine

O-AMKD

Etonitaze-  
pyne

Dipya-  
none

2-Me-AP-  
237

2F-  
viminol

Bror-  
phine

Meto-  
nitazene

Flu-  
nitazene

Buto-  
nitazene

Desmethyl-  
moramide

4F-Fu-  
fentanyl

Crotonyl-  
fentanyl

Metodes-  
nitazene

Carbonyl-  
bromadol

Proto-  
nitazene

AP-237

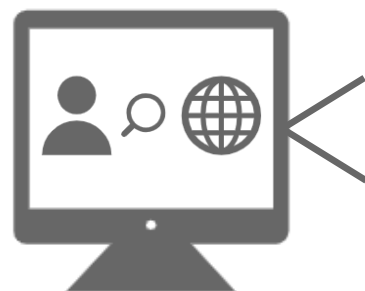
Isoto-  
nitazene

Isobutyr-  
fentanyl

AP-238

4-(Trifluoro-  
methyl)-U-  
47700

# Opioids monitored by the EMCDDA EU EWS, 2019-2021



## Opioid's Sample Pack (#1)

You will receive 1g / 2g / 5g / 10g of the each following chemicals

O-DSMT

2f-viminol powder

PIPERIDYLTHIAMBUTENE

2-methyl-ap-237

2019

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fentanyl

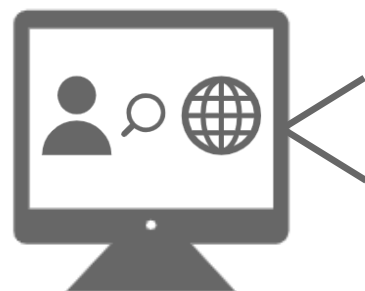
AP-238

4-(Trifluoro-  
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2019



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O-DSMT  
2f-viminol powder  
PIPERIDYLTHIAMBUTENE  
2-methyl-ap-237

2020

2021

## Opioid's Sample Pack (#1)

You will receive 1g / 2g / 5g / 10g of the each following chemicals

ETONITAZEPYNE  
2-METHYL-AP-237  
O-DSMT  
PROTONITAZENE

DIPYANONE  
BUTONITAZENE  
Metonitazene  
EtaZen

2022

Piperidyl-  
thiam-  
butene

Furanyl  
UF-17

Etazene

Nortilidine

O-AMKD

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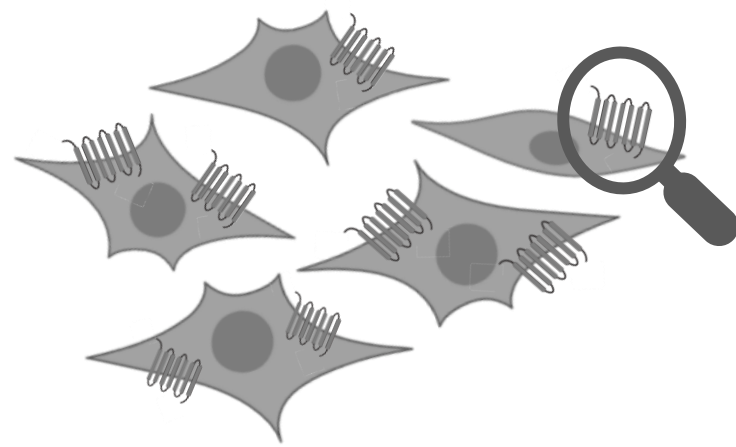
AP-237

Isoto-  
nitazene

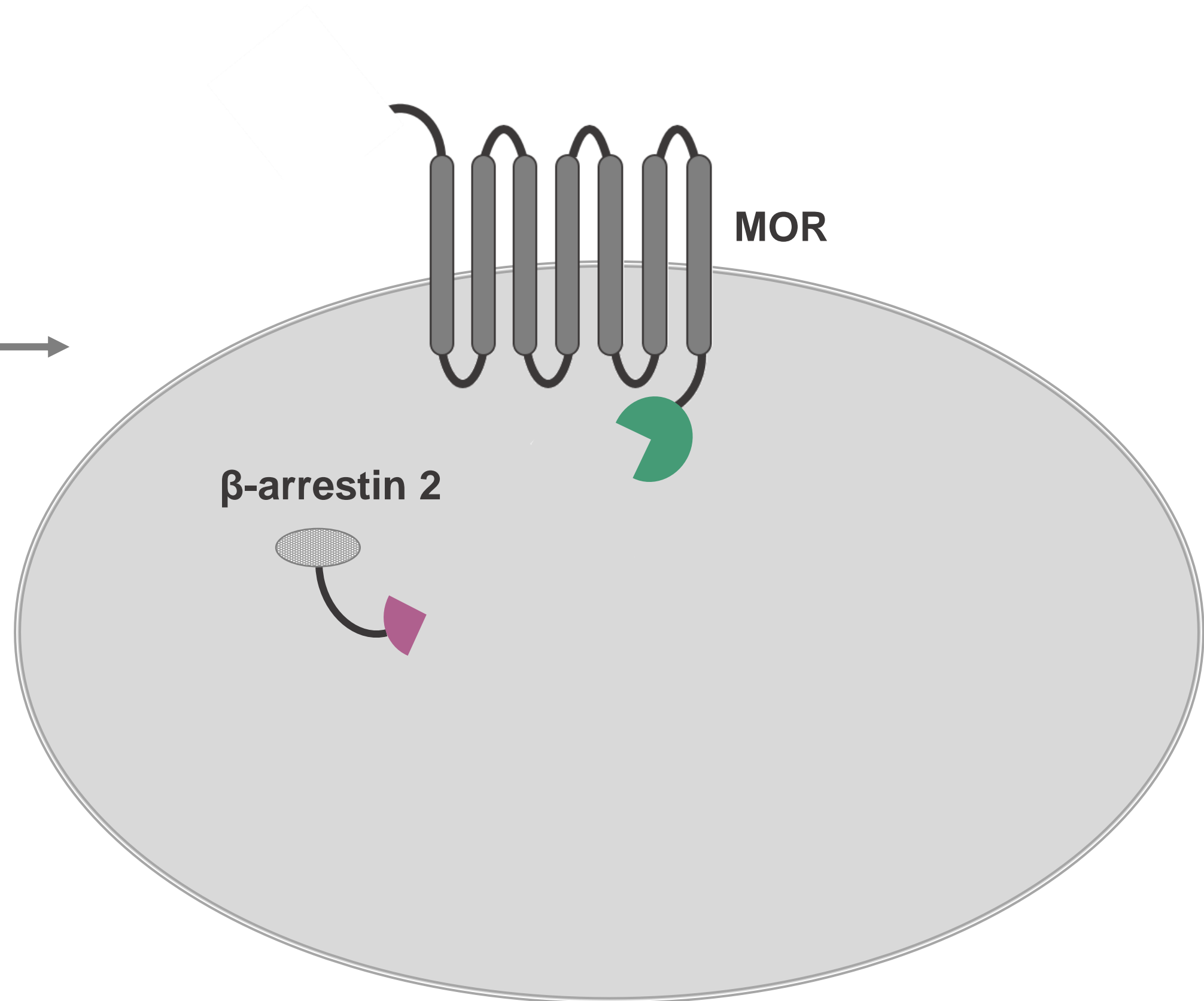
Isobutyr-  
fentanyl

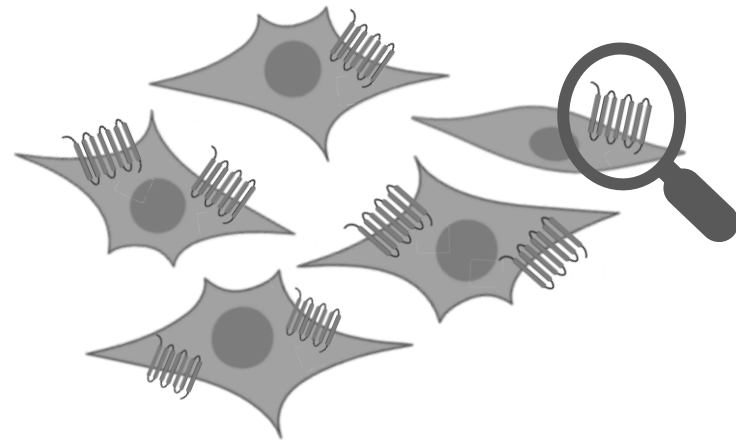
AP-238

4-(Trifluoro-  
methyl)-U-  
47700

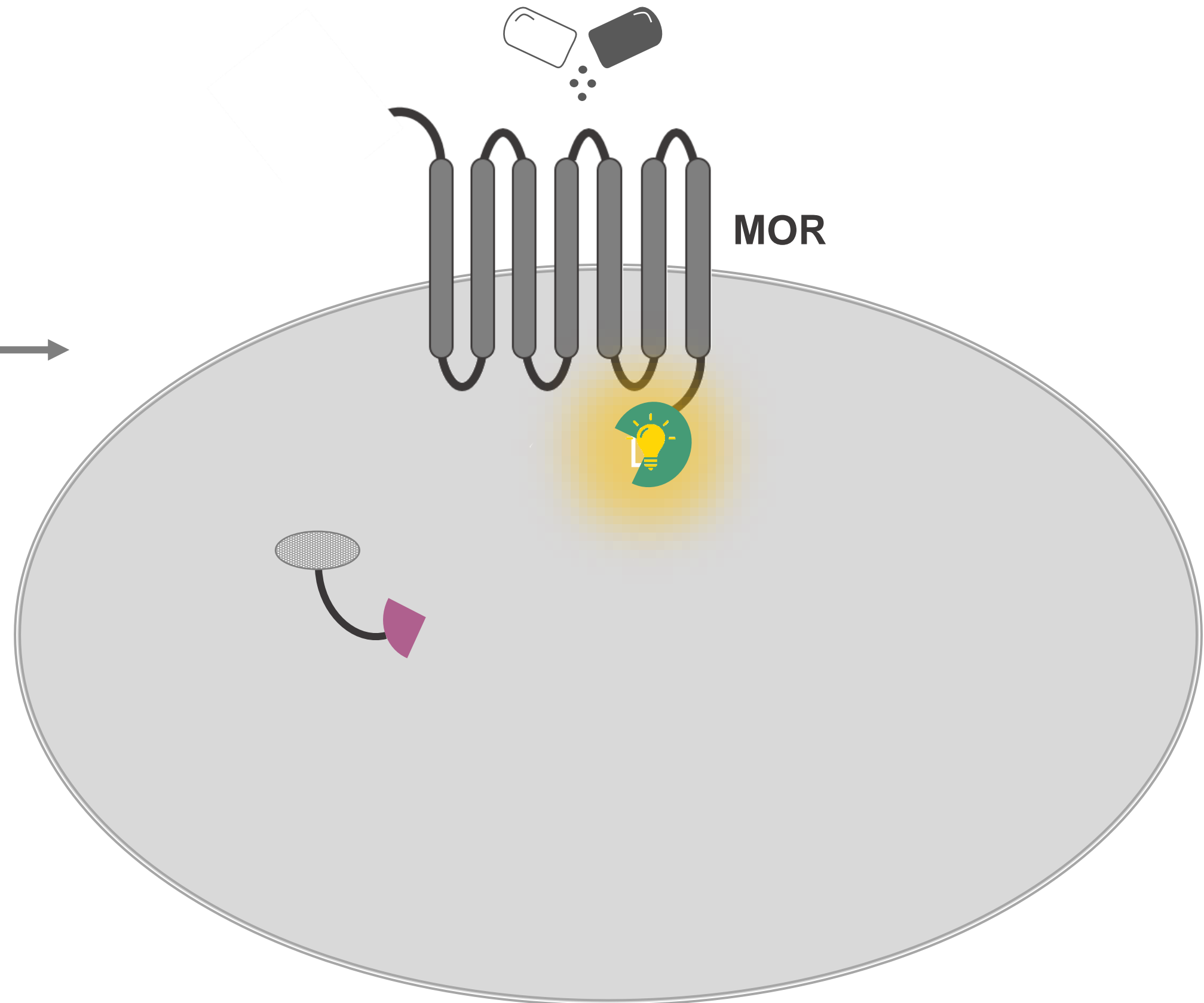


Modified HEK-293T cells



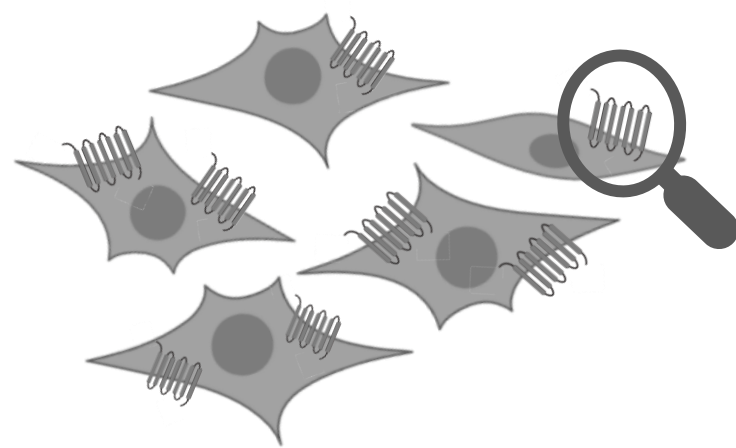


**Modified HEK-293T cells**

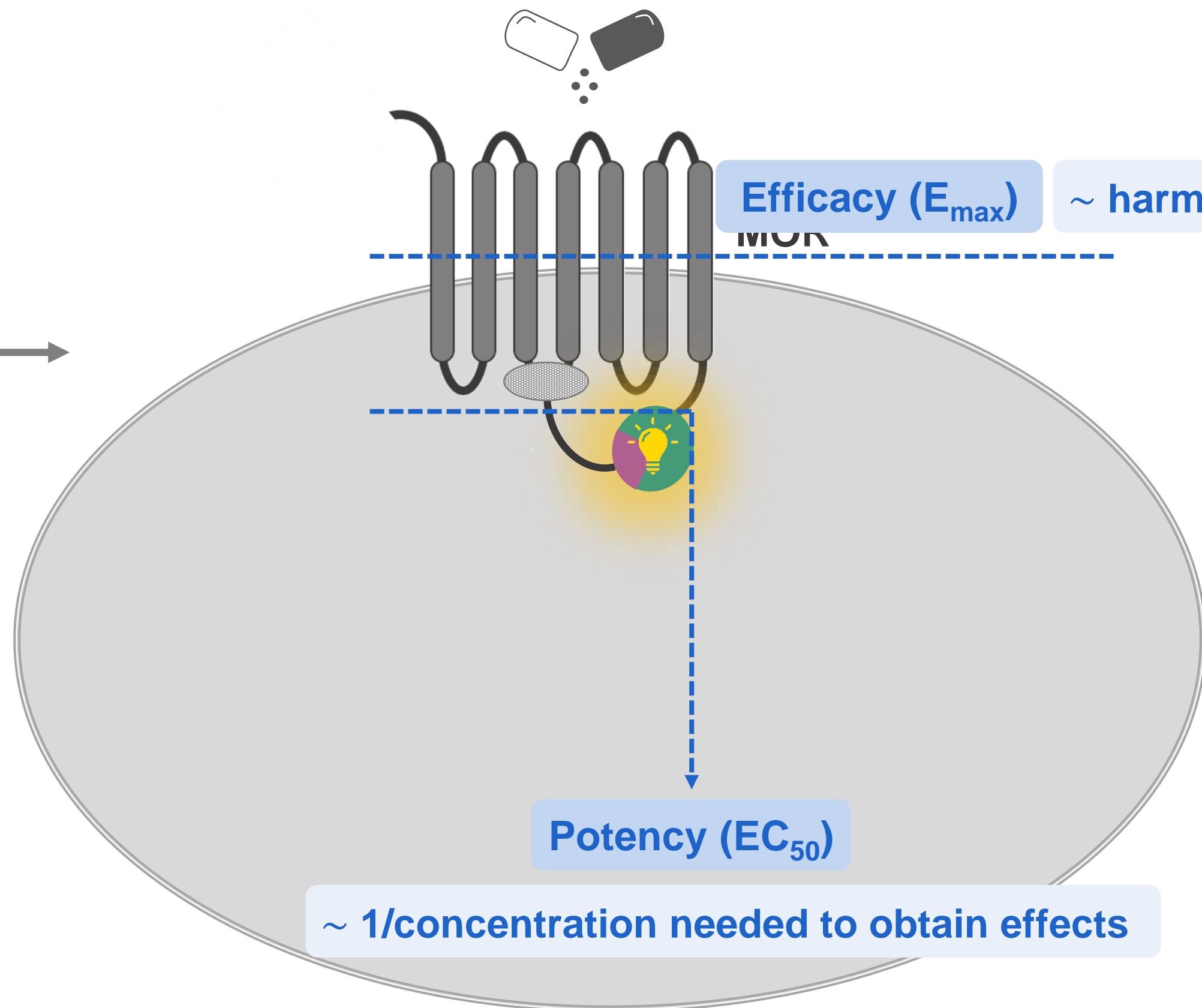




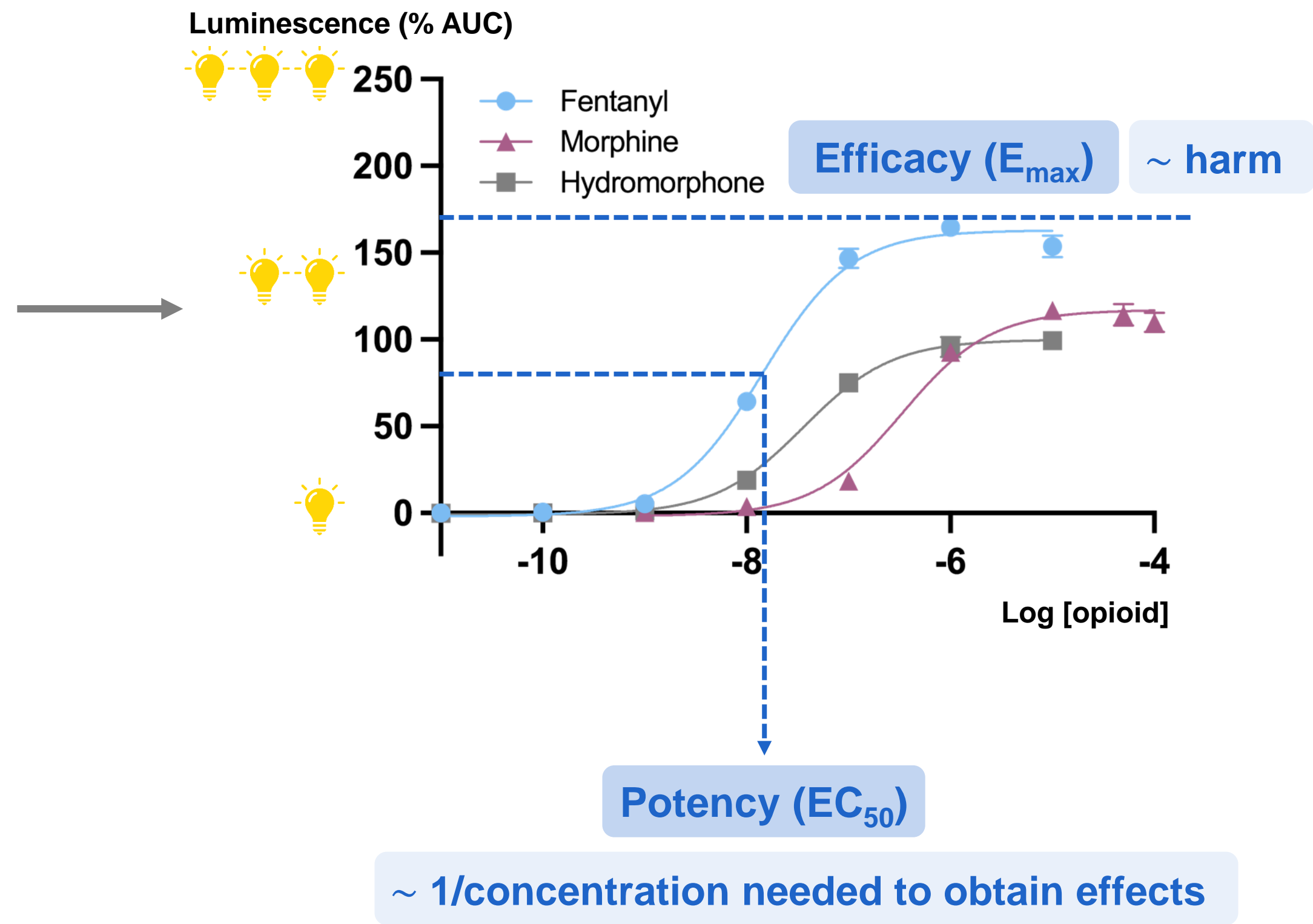
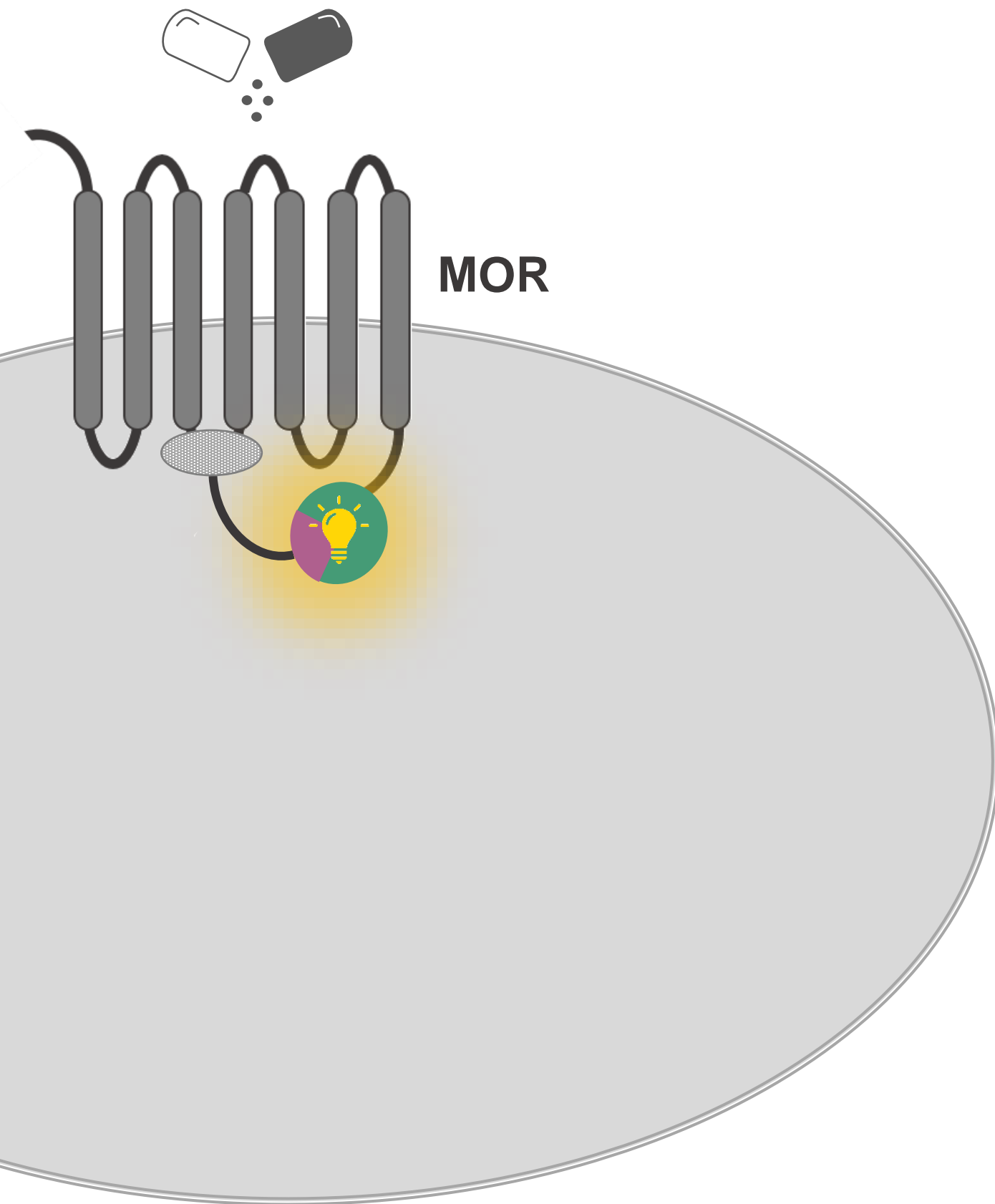
# In vitro characterization: NanoBiT<sup>®</sup> $\mu$ -opioid receptor (MOR) activation assay



Modified HEK-293T cells



# In vitro characterization: NanoBiT<sup>®</sup> $\mu$ -opioid receptor (MOR) activation assay



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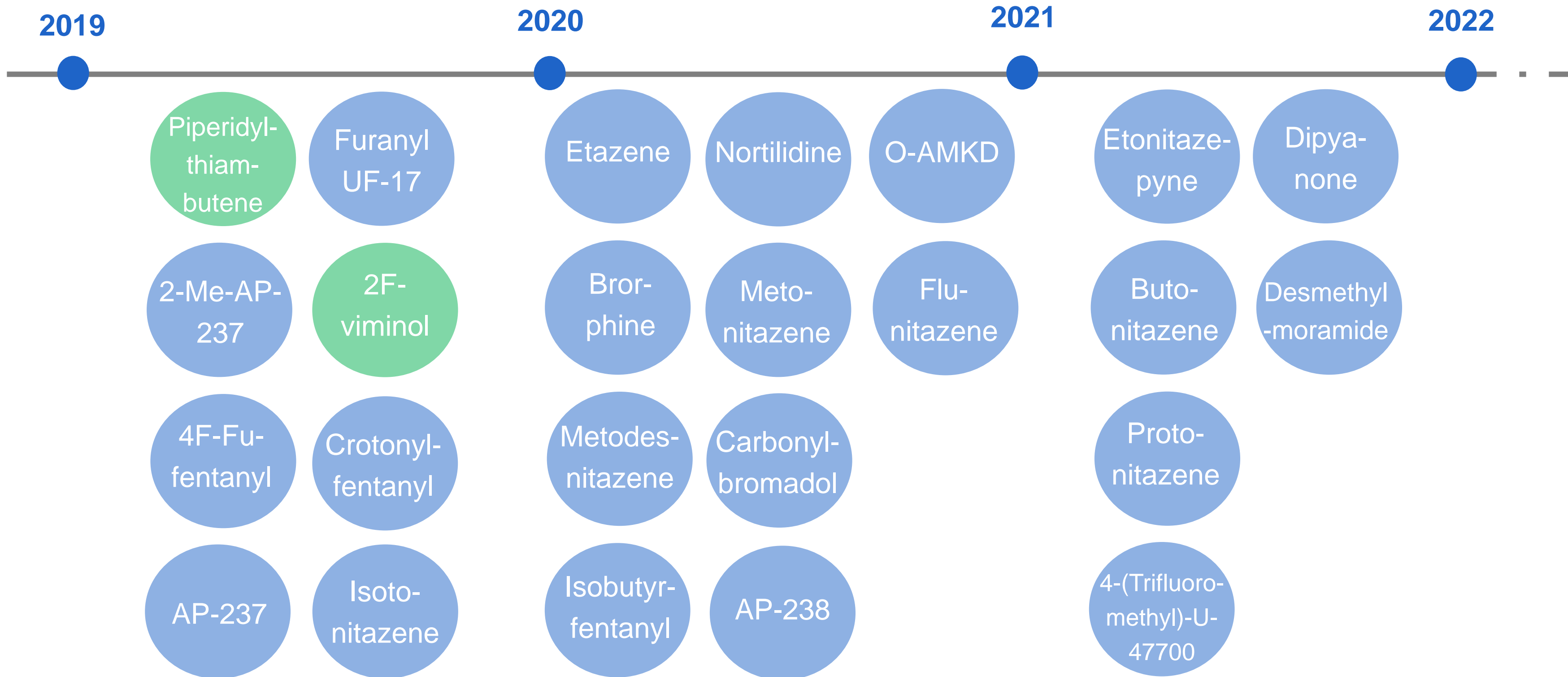
Isoto-  
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AP-238

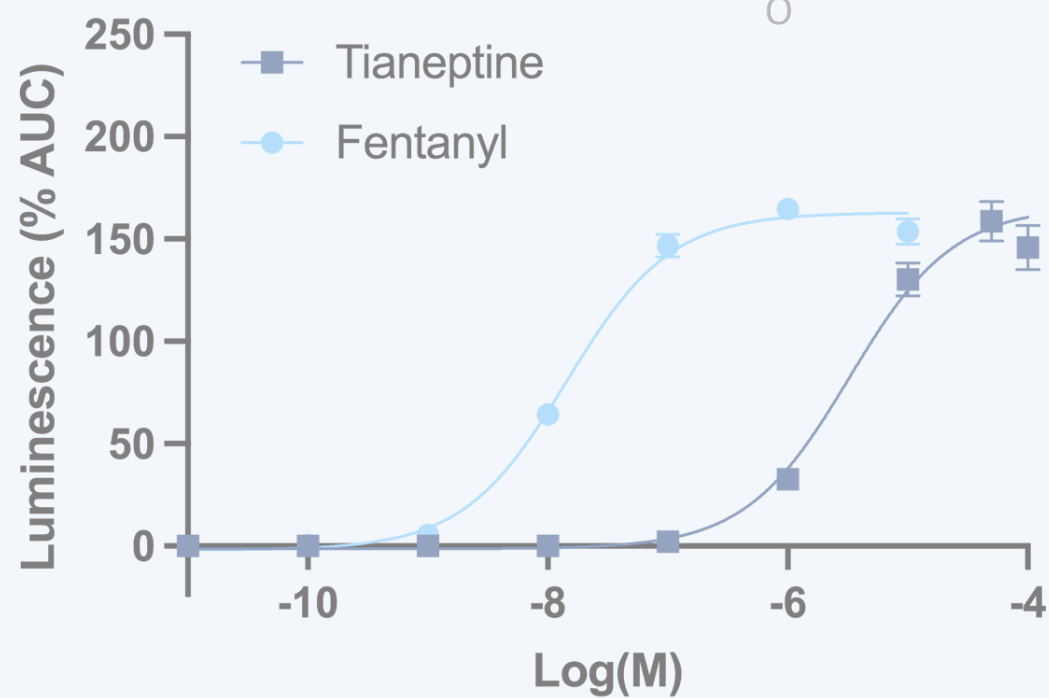
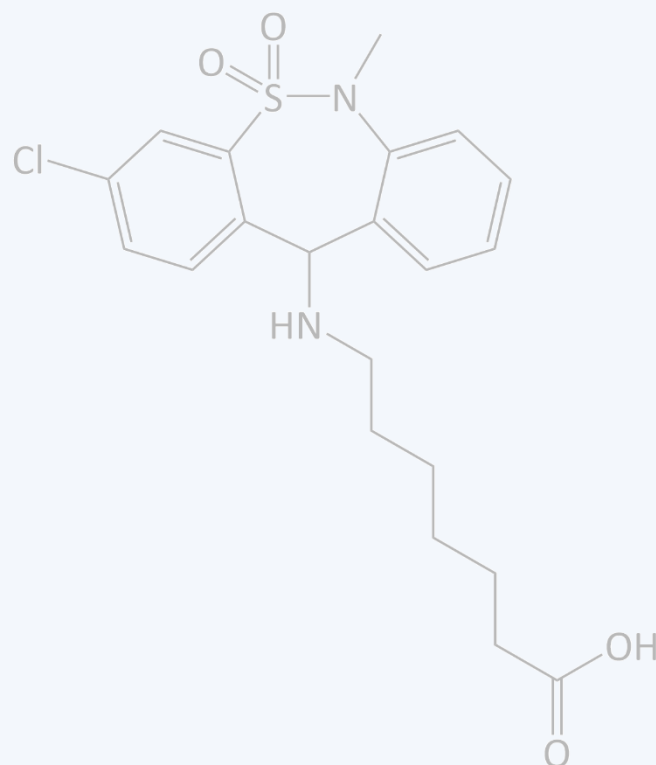
4-(Trifluoro-  
methyl)-U-  
47700

# Opioids monitored by the EMCDDA EU EWS, 2019-2021



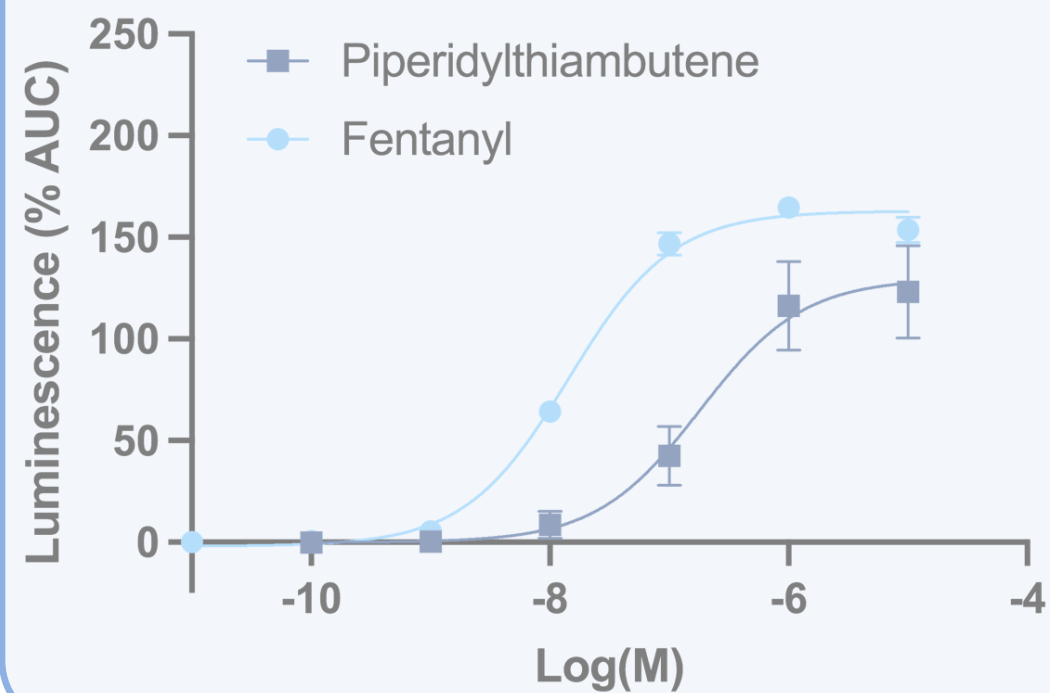
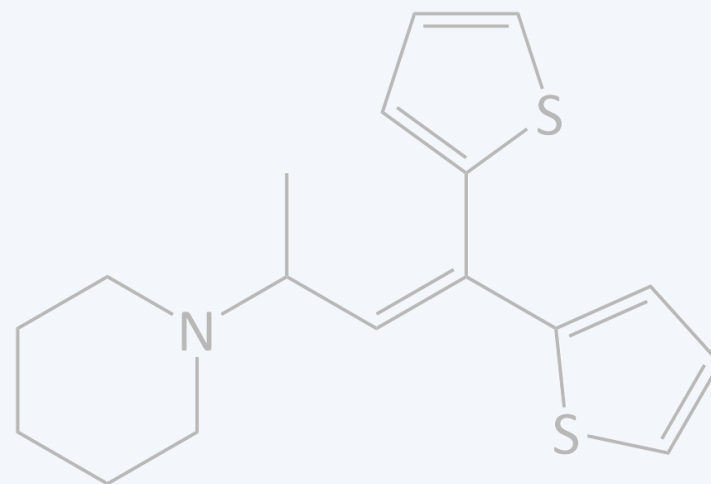


## Tianeptine

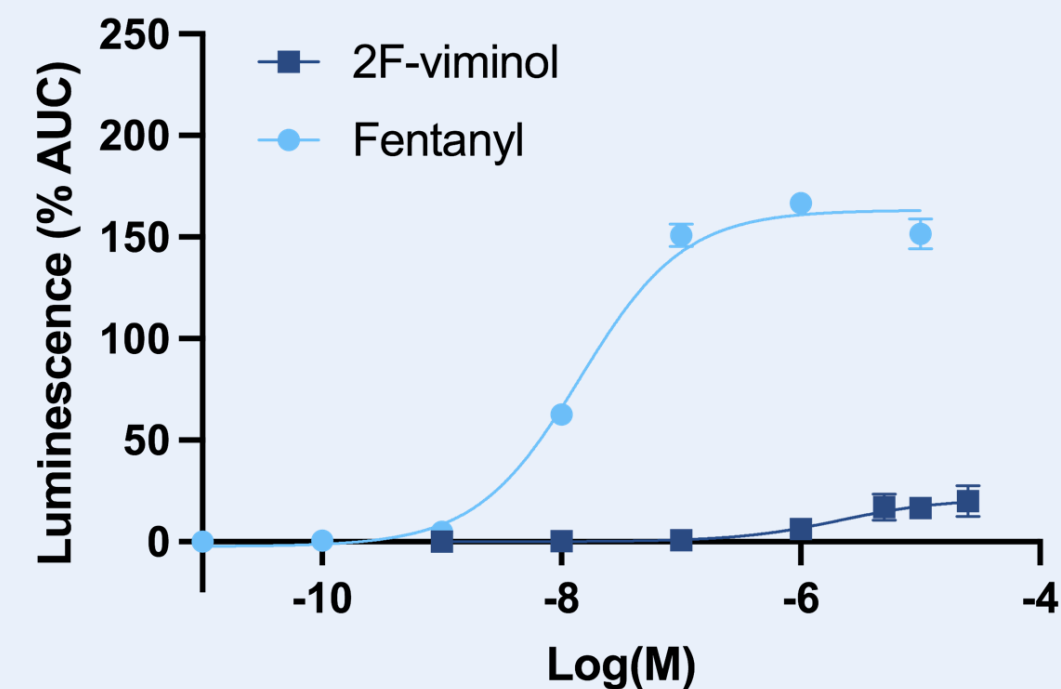
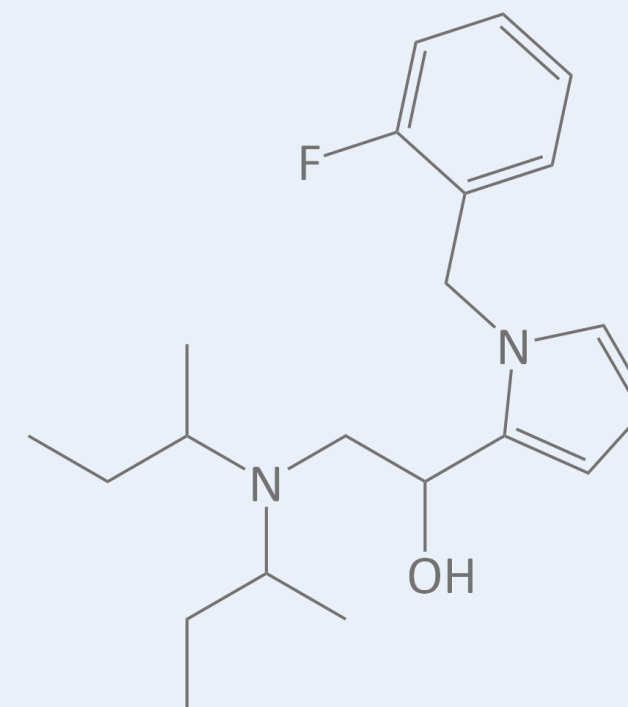


Vandeputte *et al.* (2020), Arch. Toxicol.

## Piperidylthiambutene

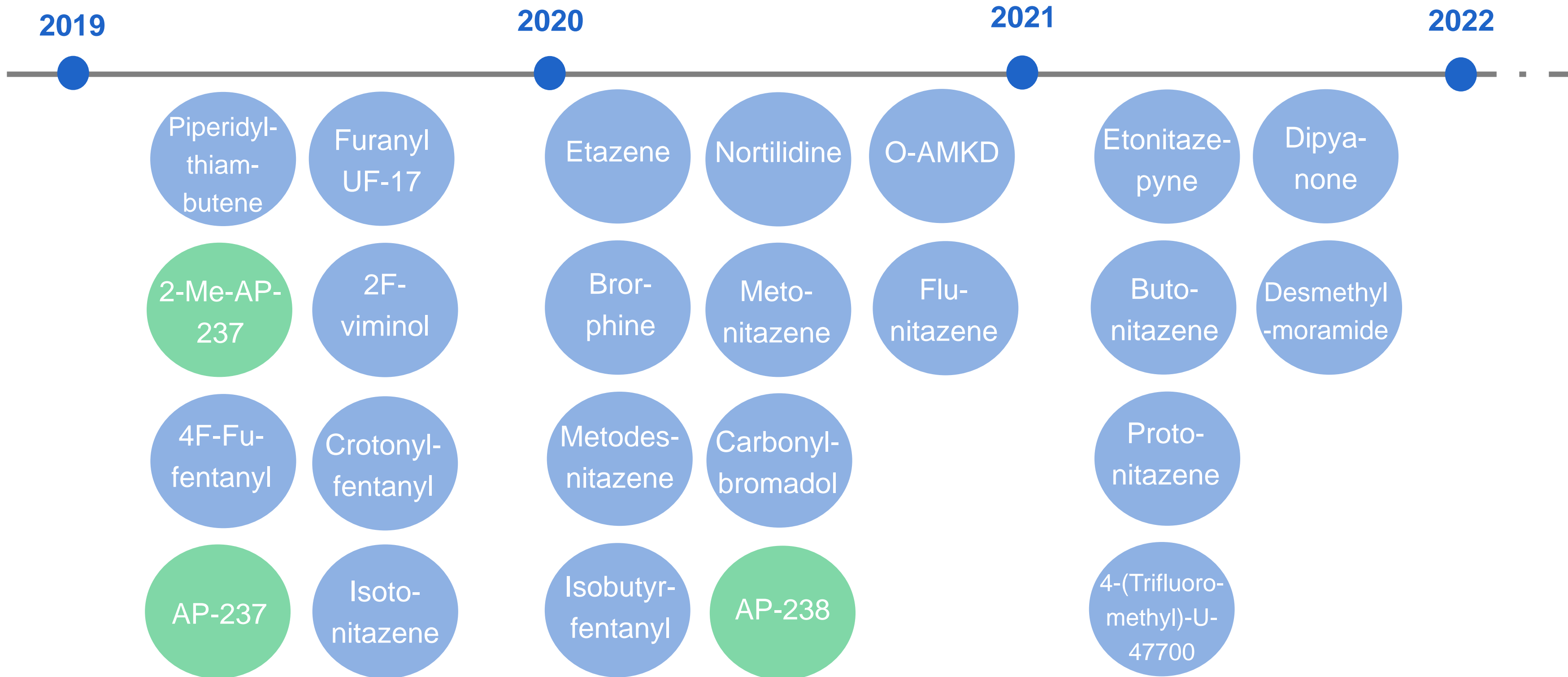


## 2F-viminol



Vandeputte *et al.* (2022), Arch. Toxicol.

# Opioids monitored by the EMCDDA EU EWS, 2019-2021



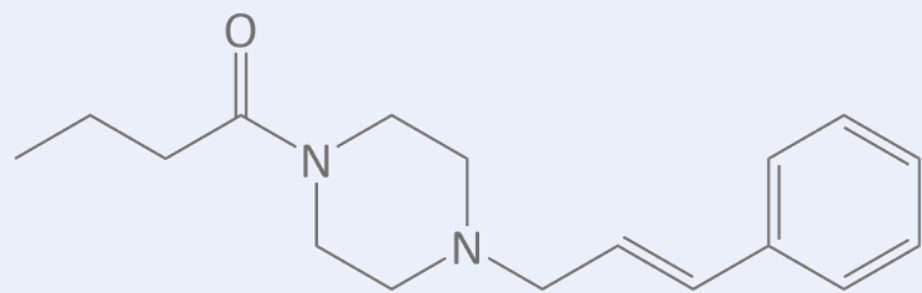
# Cinnamylpiperazine "AP"-opioids



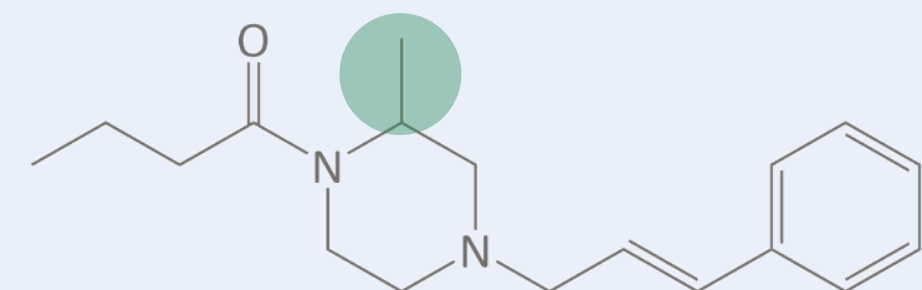
Fogarty & Vandeputte *et al.* (2022), Arch. Toxicol.

## AP-237

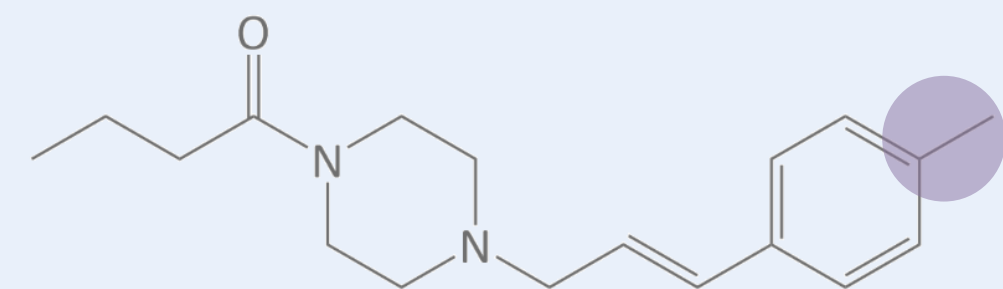
('bucinnazine')



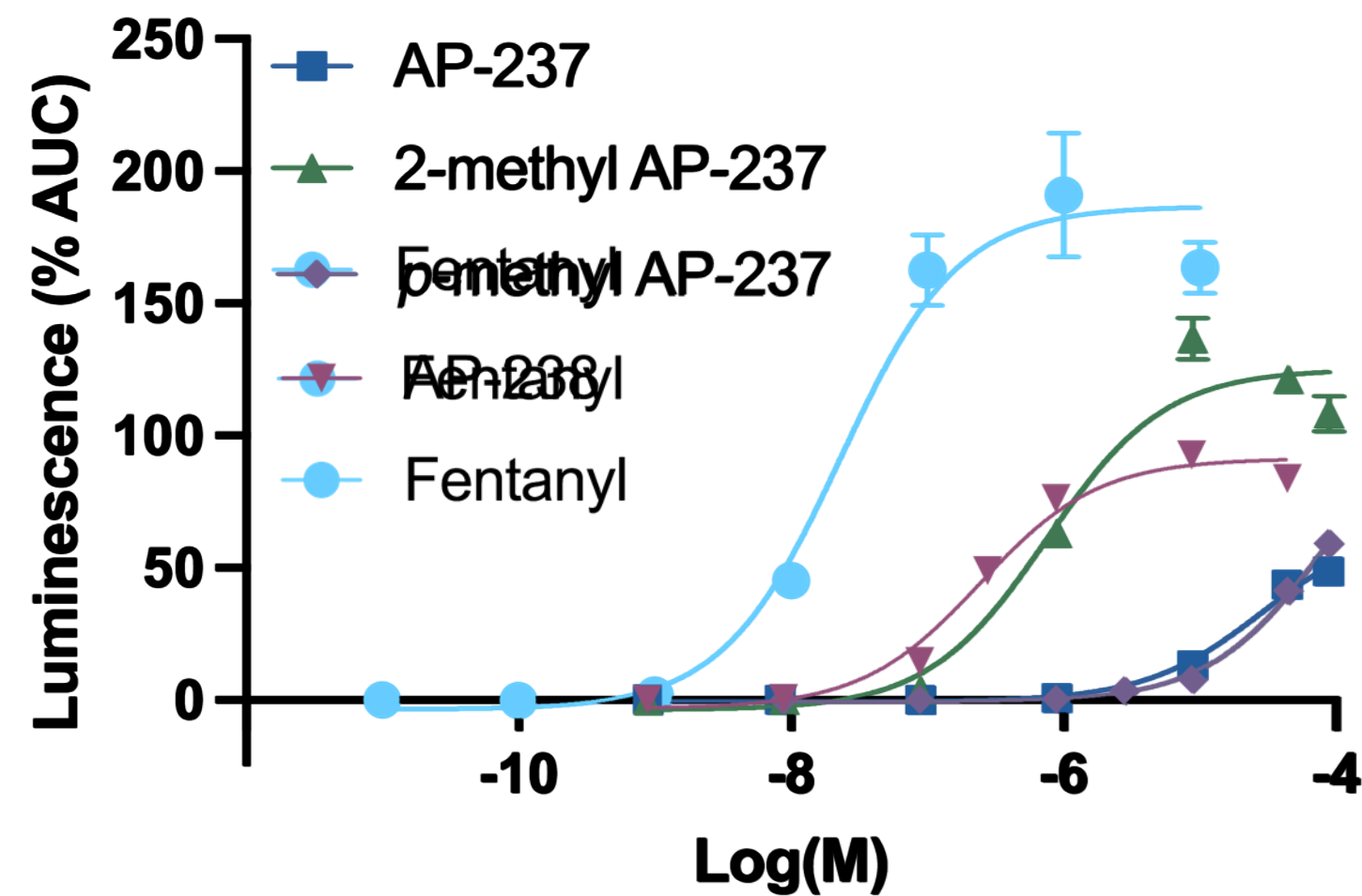
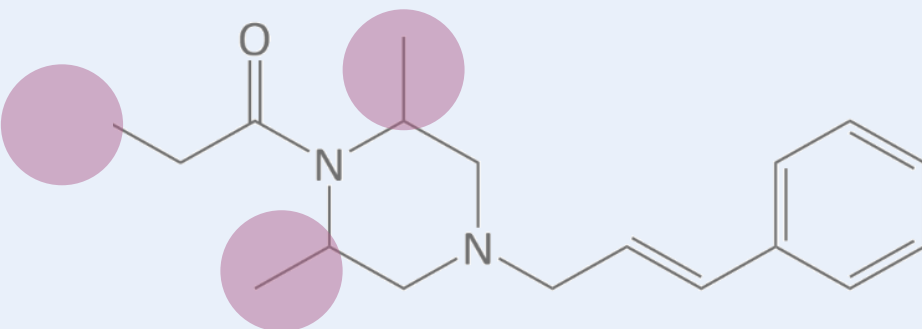
## 2-methyl AP-237



## Para-methyl AP-237



## AP-238



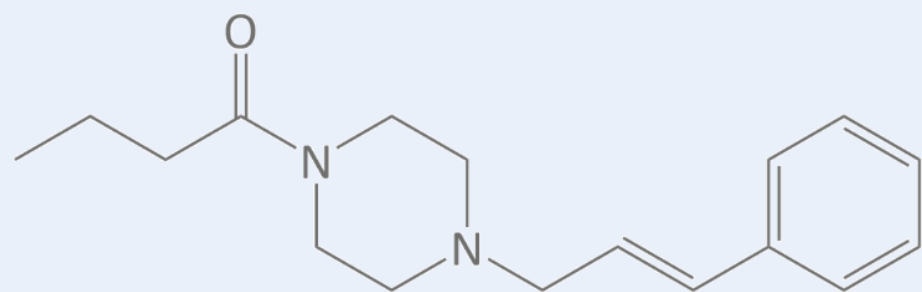
# Cinnamylpiperazine "AP"-opioids



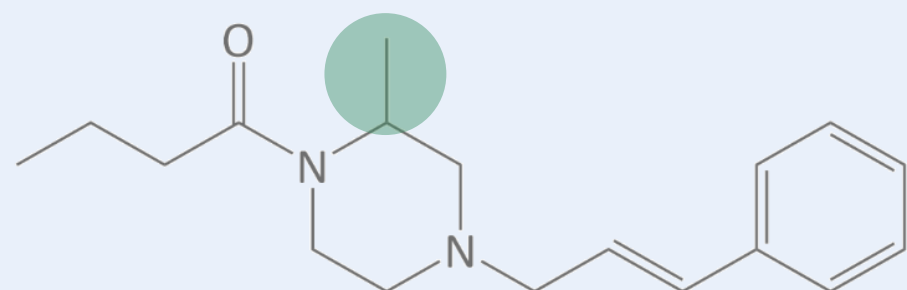
Fogarty & Vandeputte *et al.* (2022), Arch. Toxicol.

## AP-237

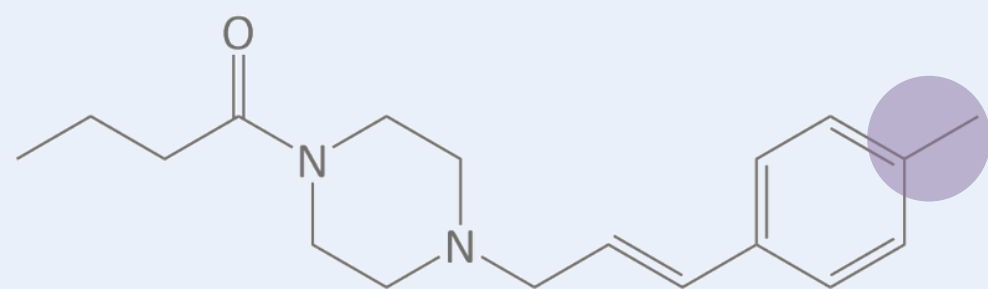
('bucinnazine')



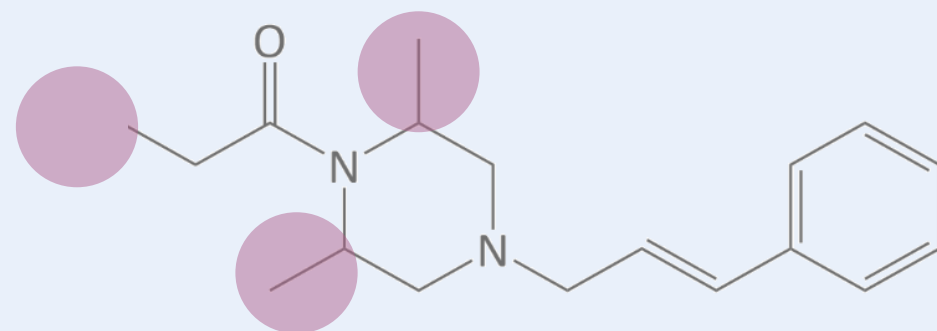
## 2-methyl AP-237



## Para-methyl AP-237

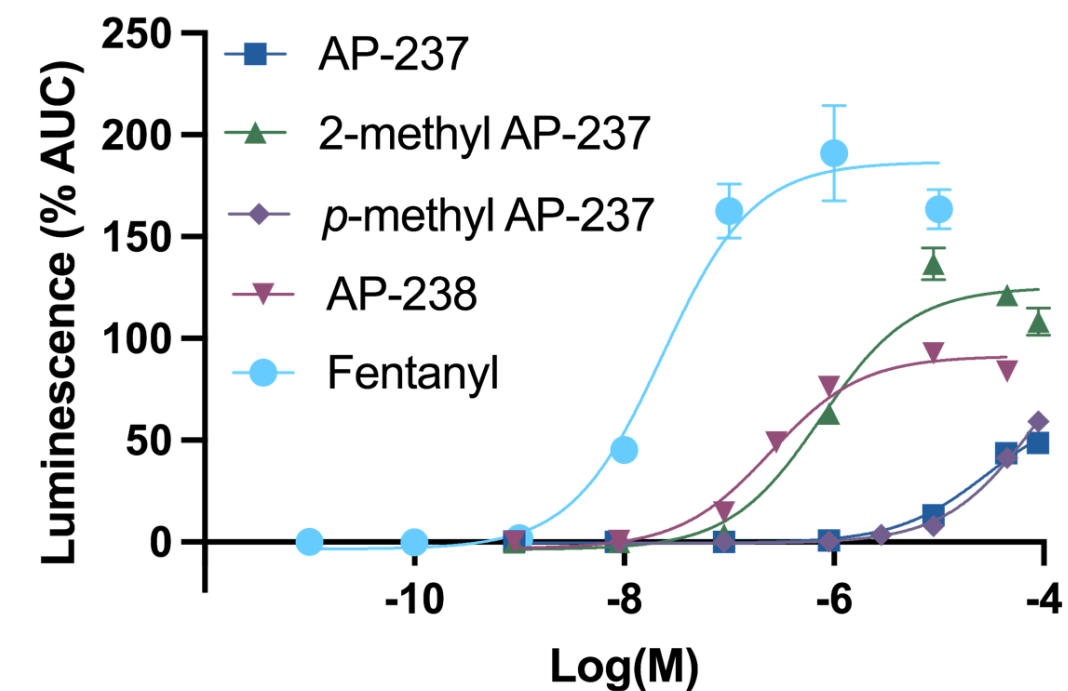


## AP-238



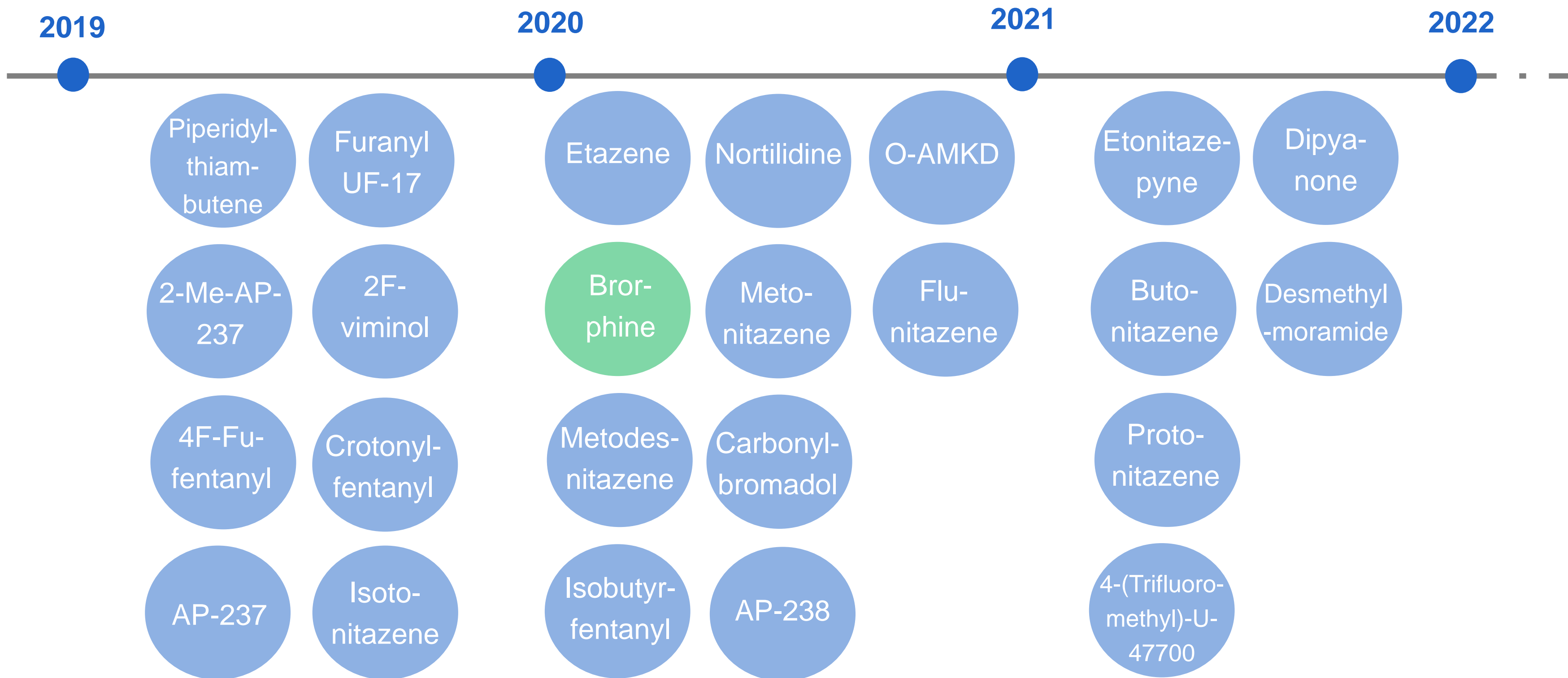
Post-mortem  
> 800 ng/mL

Post-mortem  
87-270 ng/mL



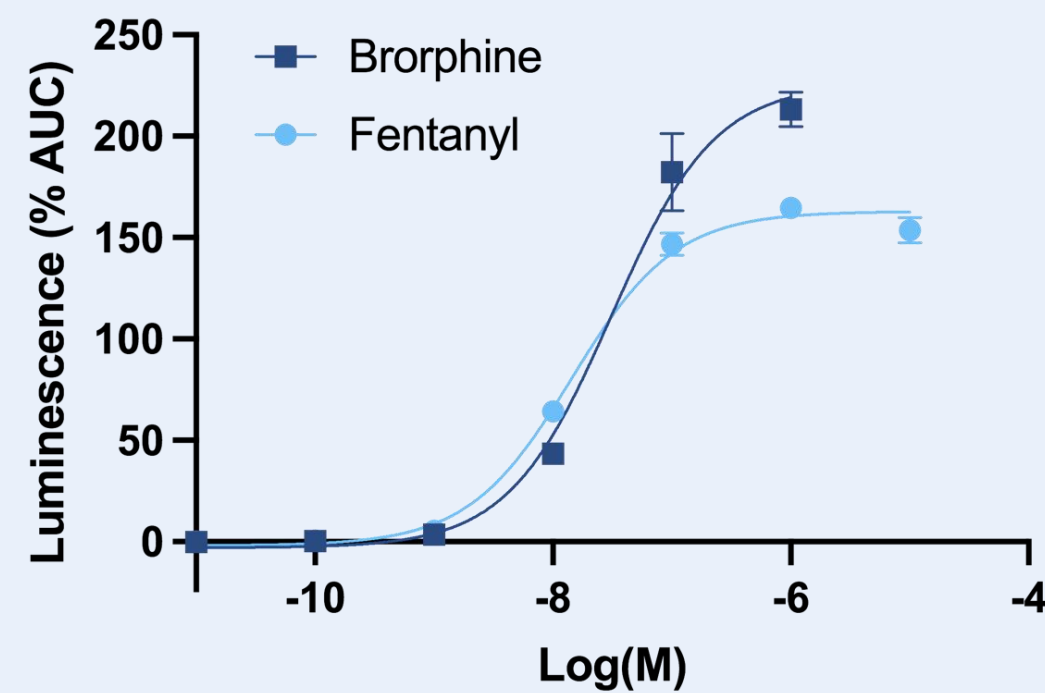
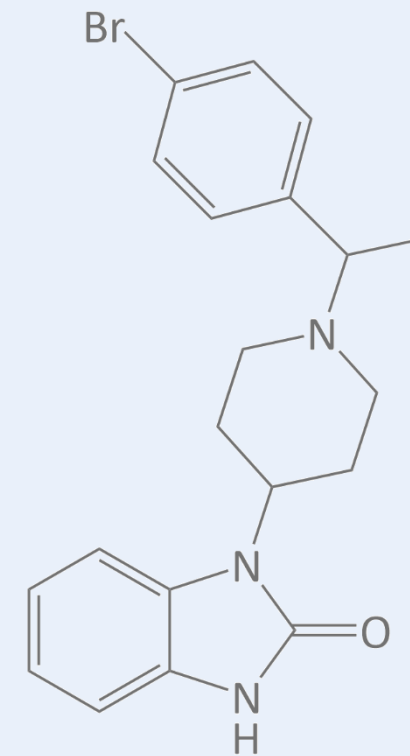


# Opioids monitored by the EMCDDA EU EWS, 2019-2021





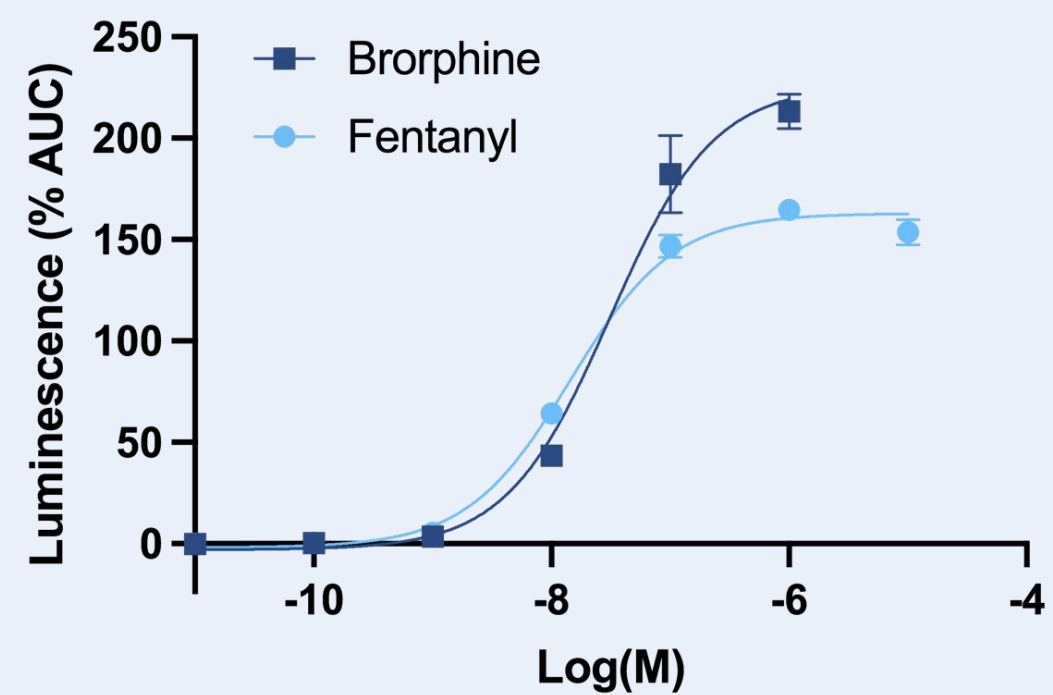
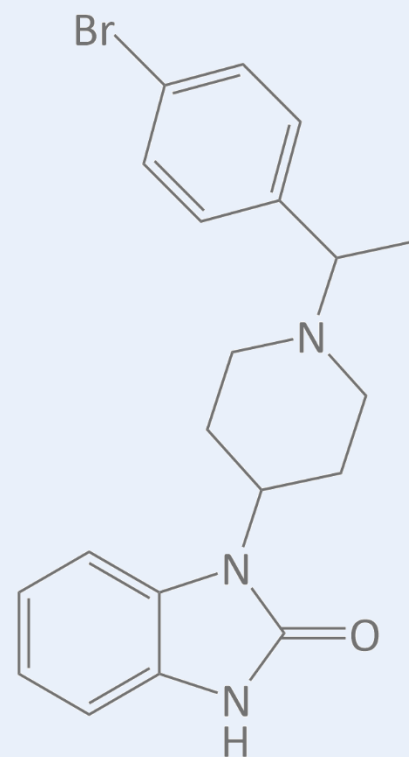
## Brorphine



Verougstraete & Vandeputte *et al.* (2020), *J. Anal. Toxicol.*

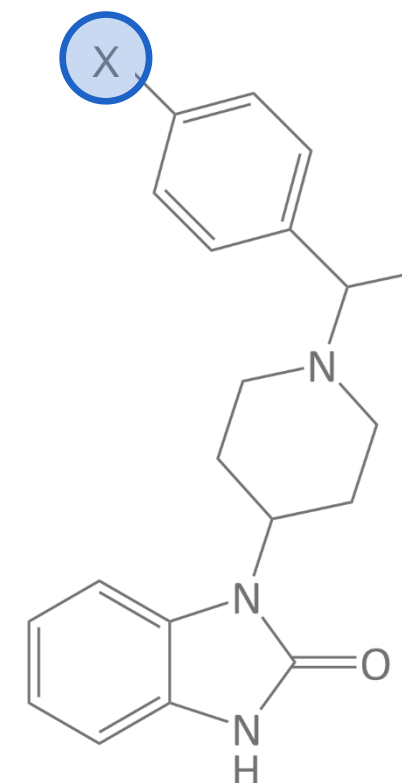


## Brorphine

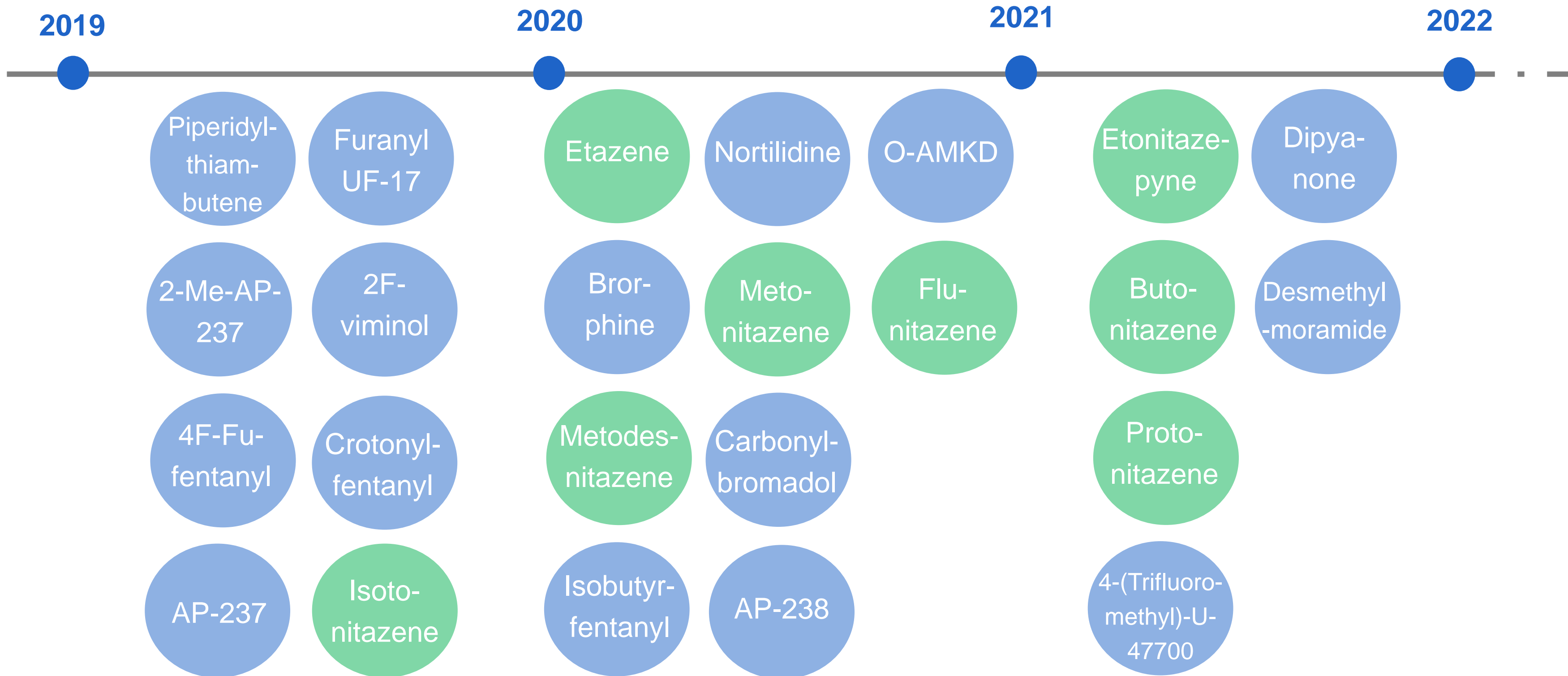


Posted by u/[deleted] 10 months ago

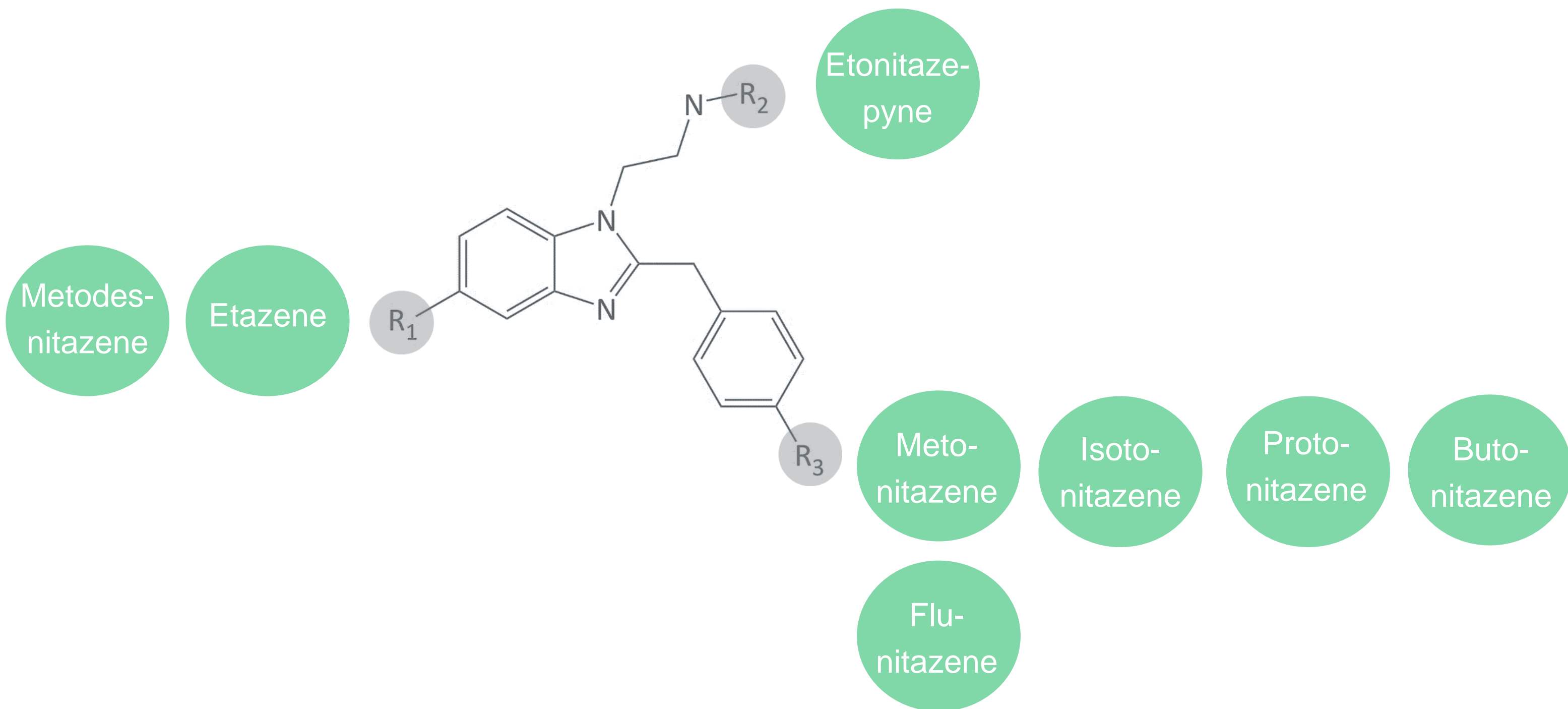
## Brorphine, Orphine and Chlorphine?



# Opioids monitored by the EMCDDA EU EWS, 2019-2021

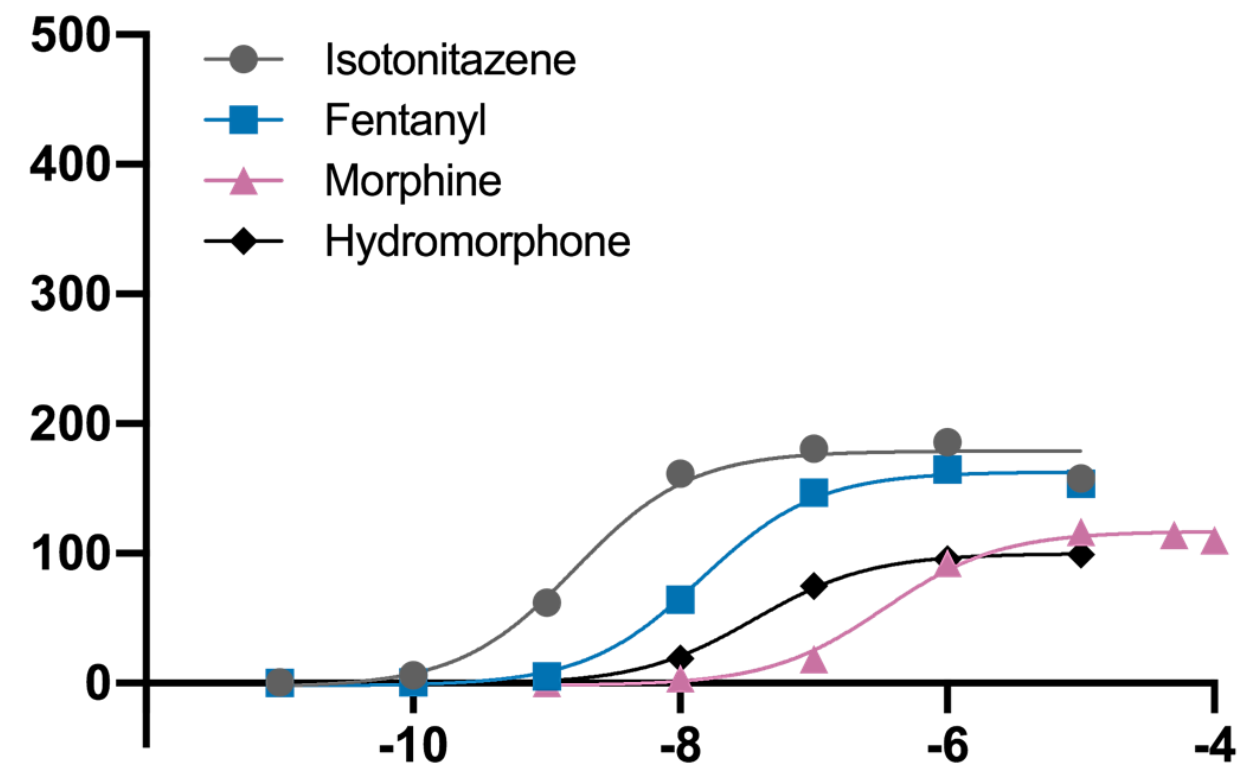
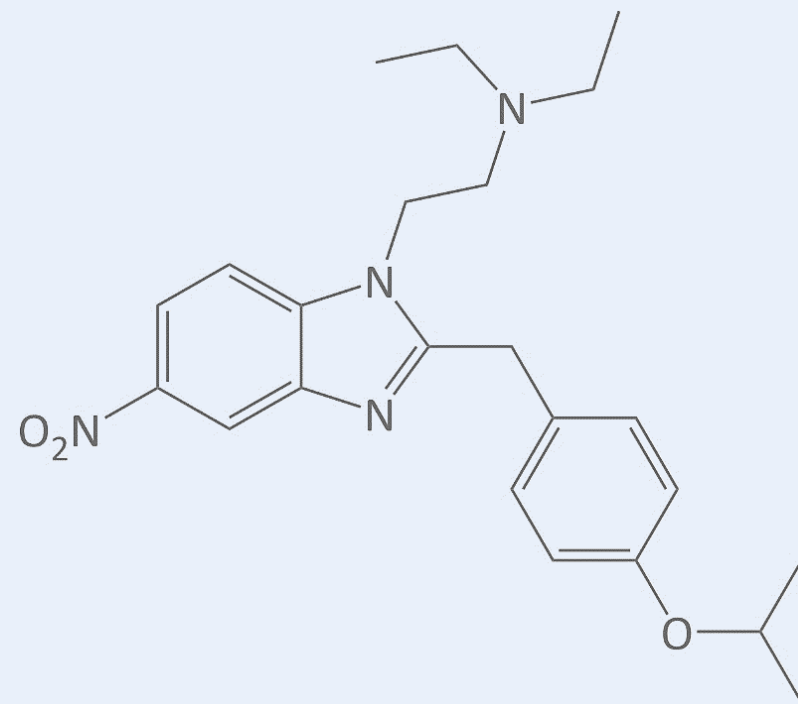


# 2-Benzylbenzimidazole 'nitazene' opioids





## Isotonitazene

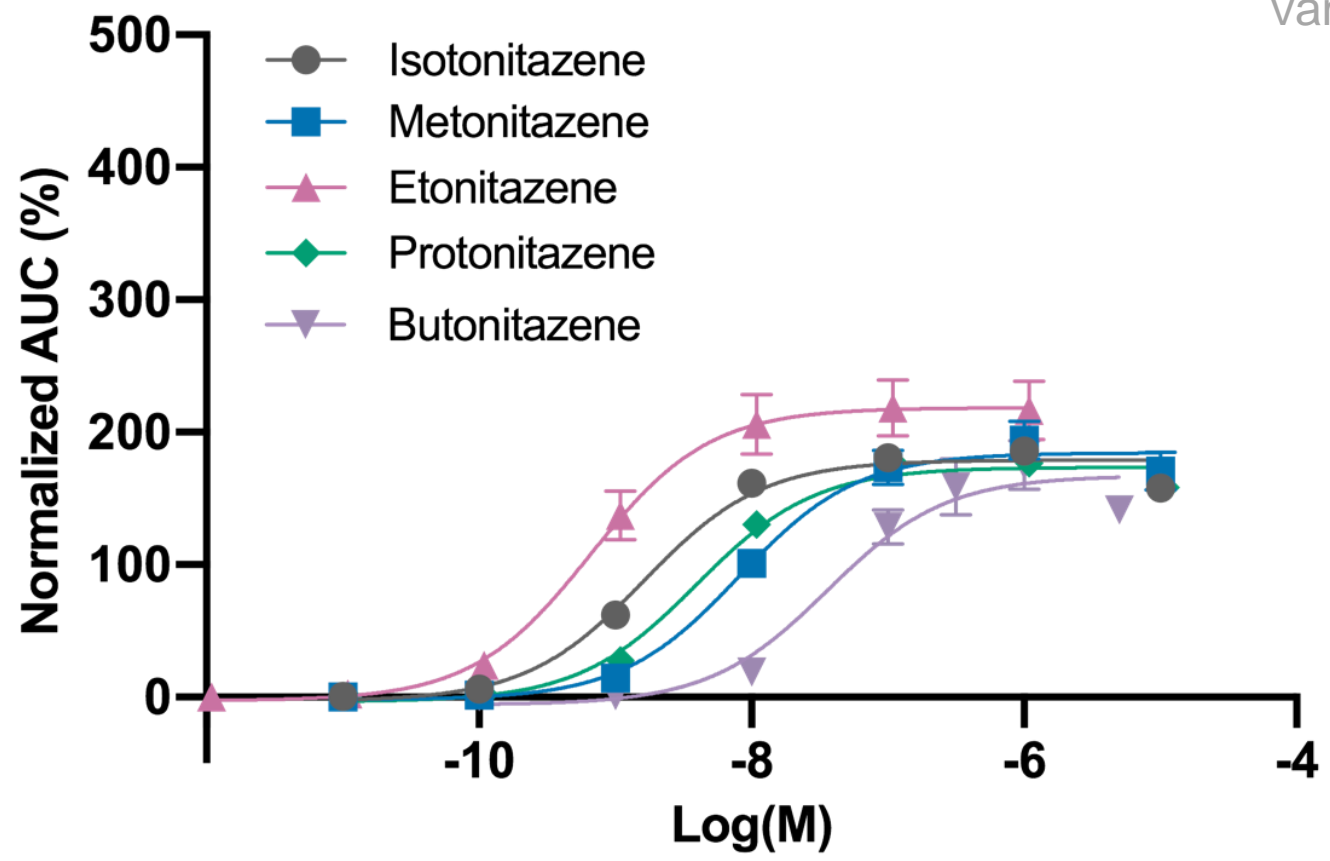
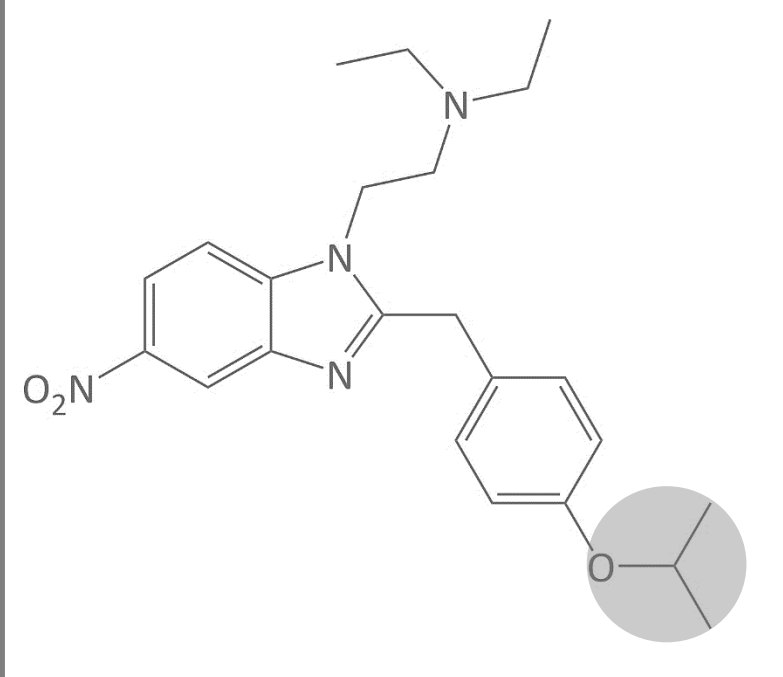


# Nitazenes: Alkoxy-variants

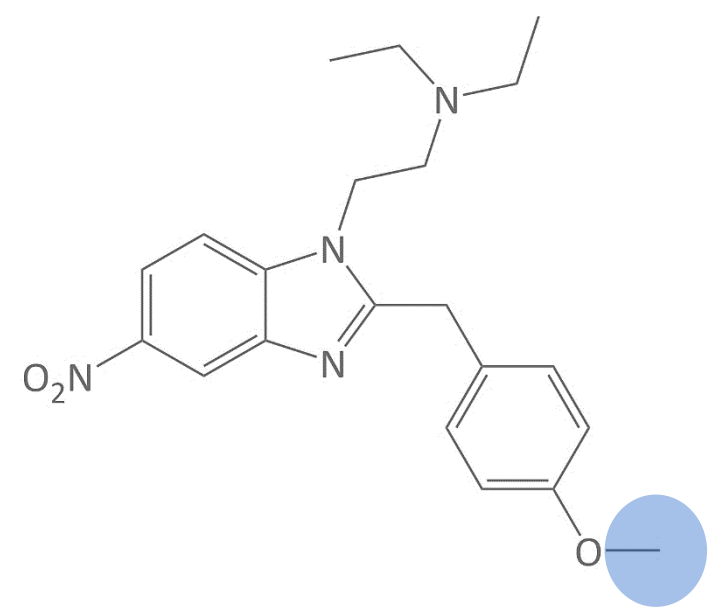


Vandeputte *et al.* (2021), ACS Chem Neurosci

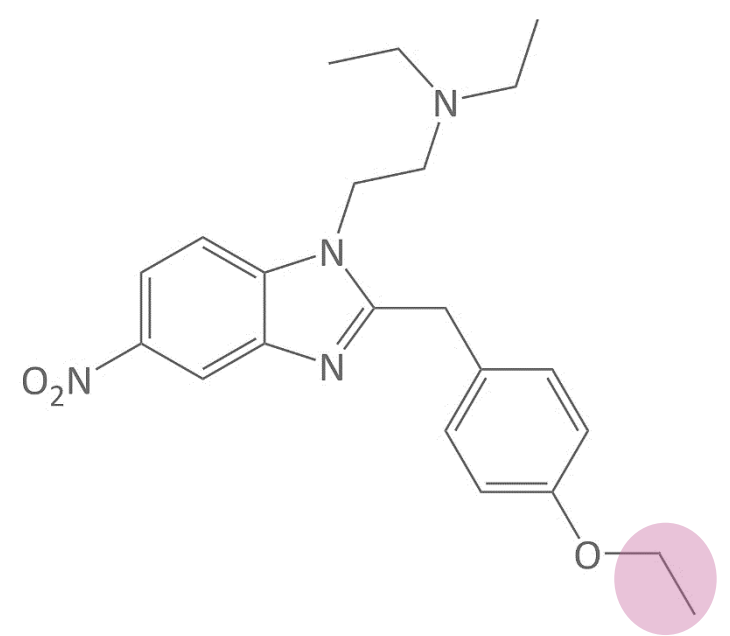
### Isotonitazene



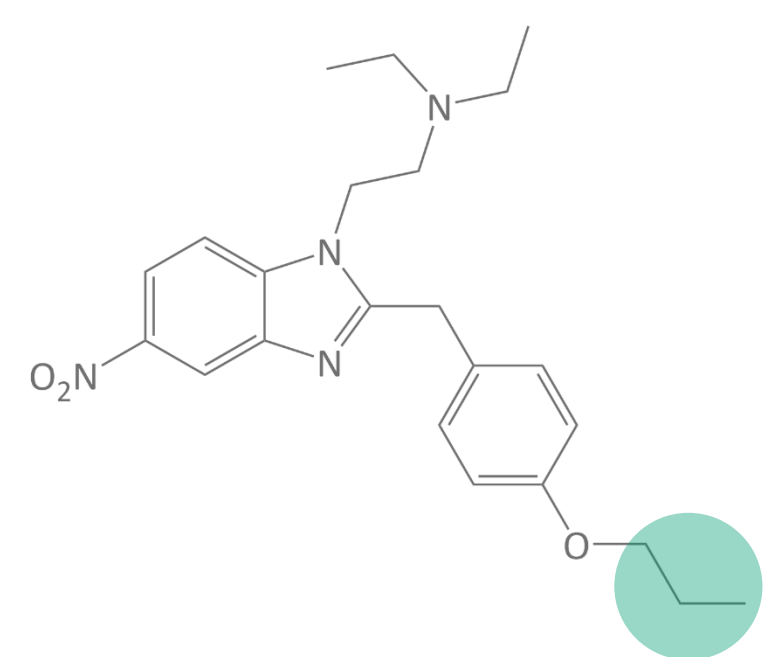
### Metonitazene 2020



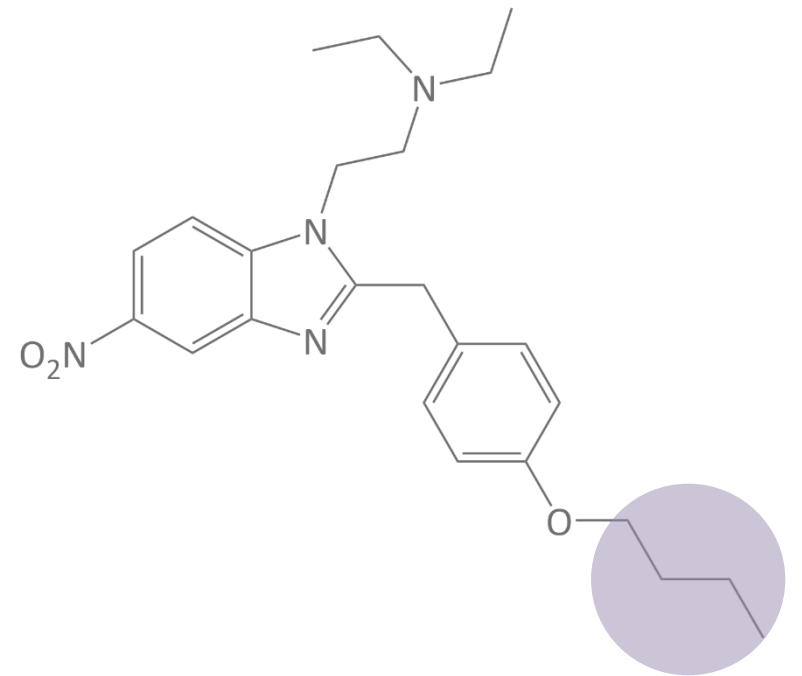
### Etonitazene



### Protonitazene 2021



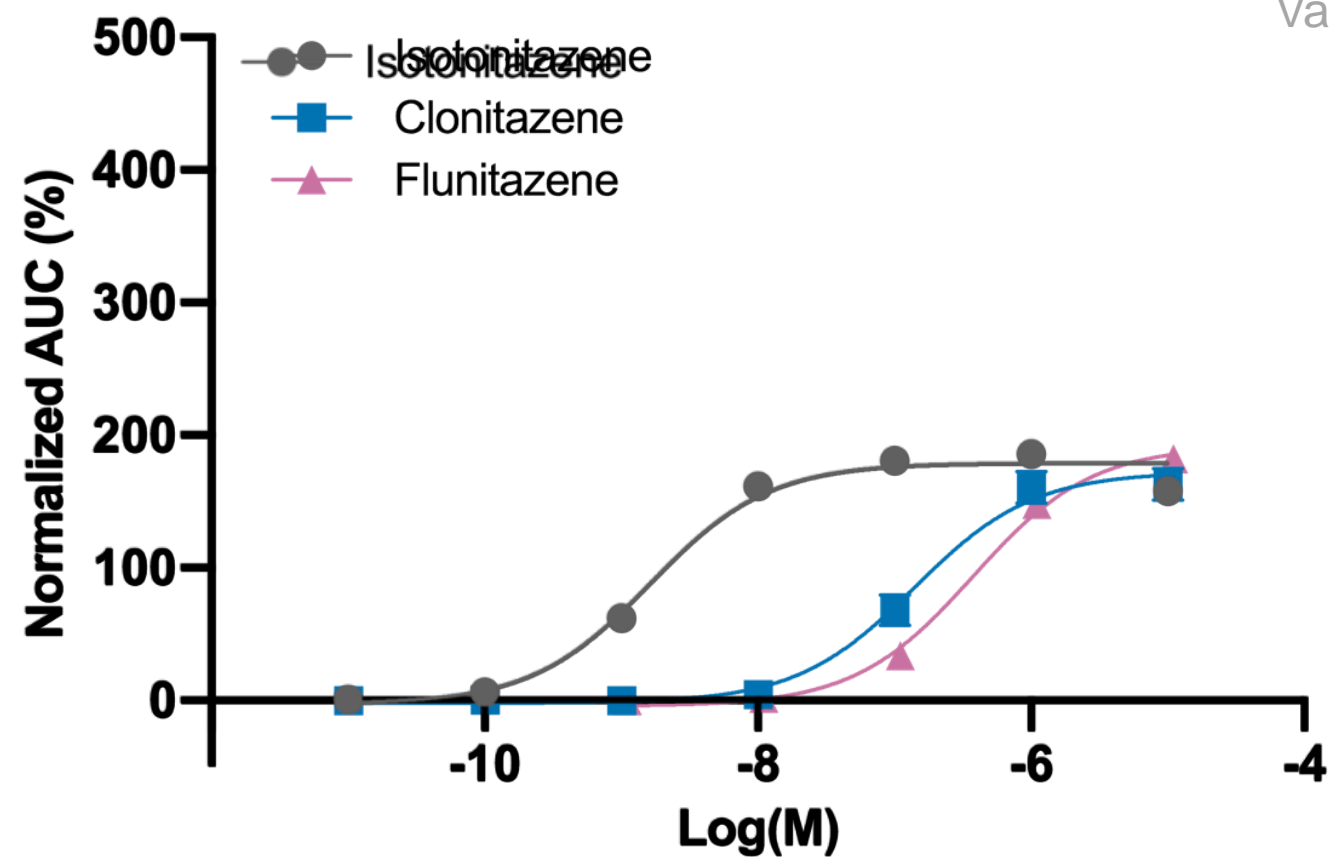
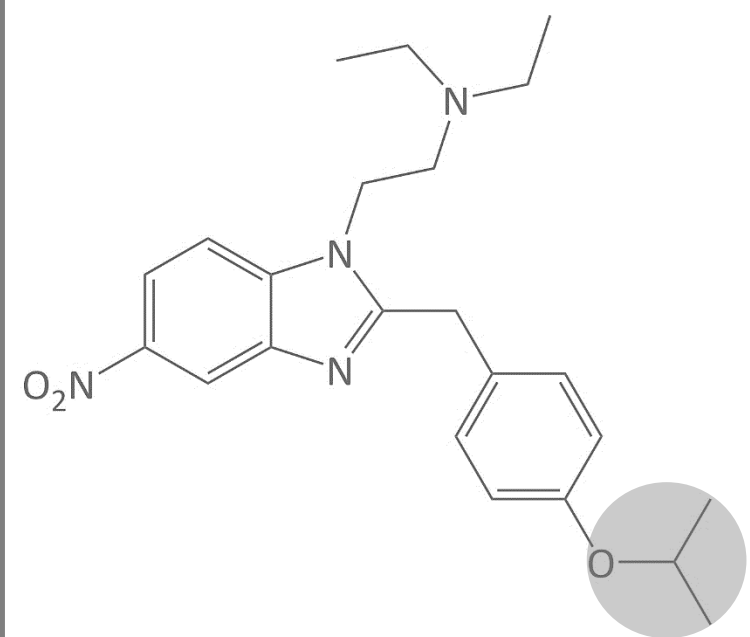
### Butonitazene 2021



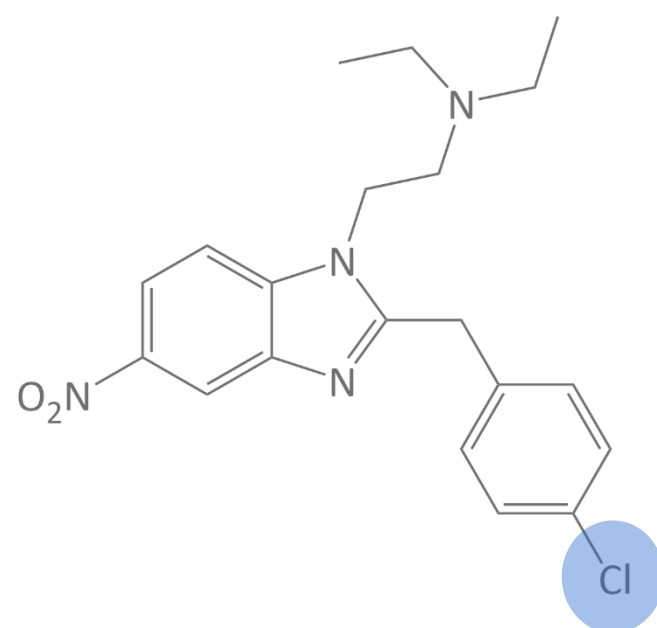
# Nitazenes: Halogenated analogues



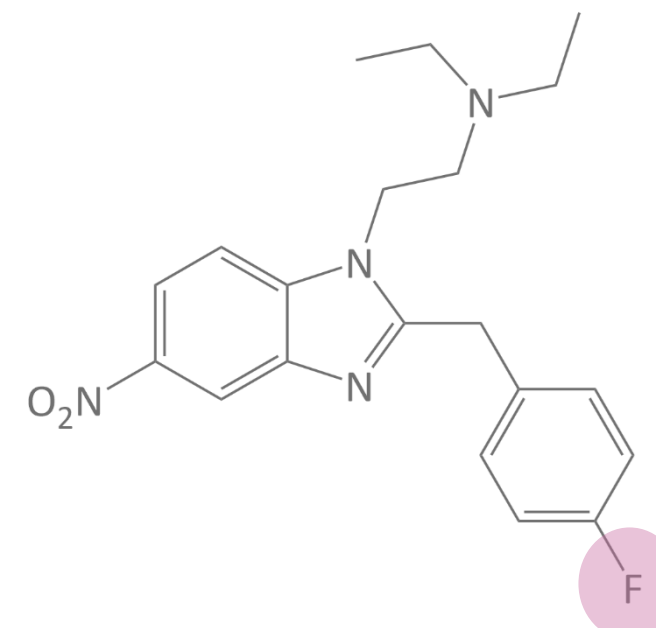
## Isotonitazene



## Clonitazene



## Flunitazene 2020

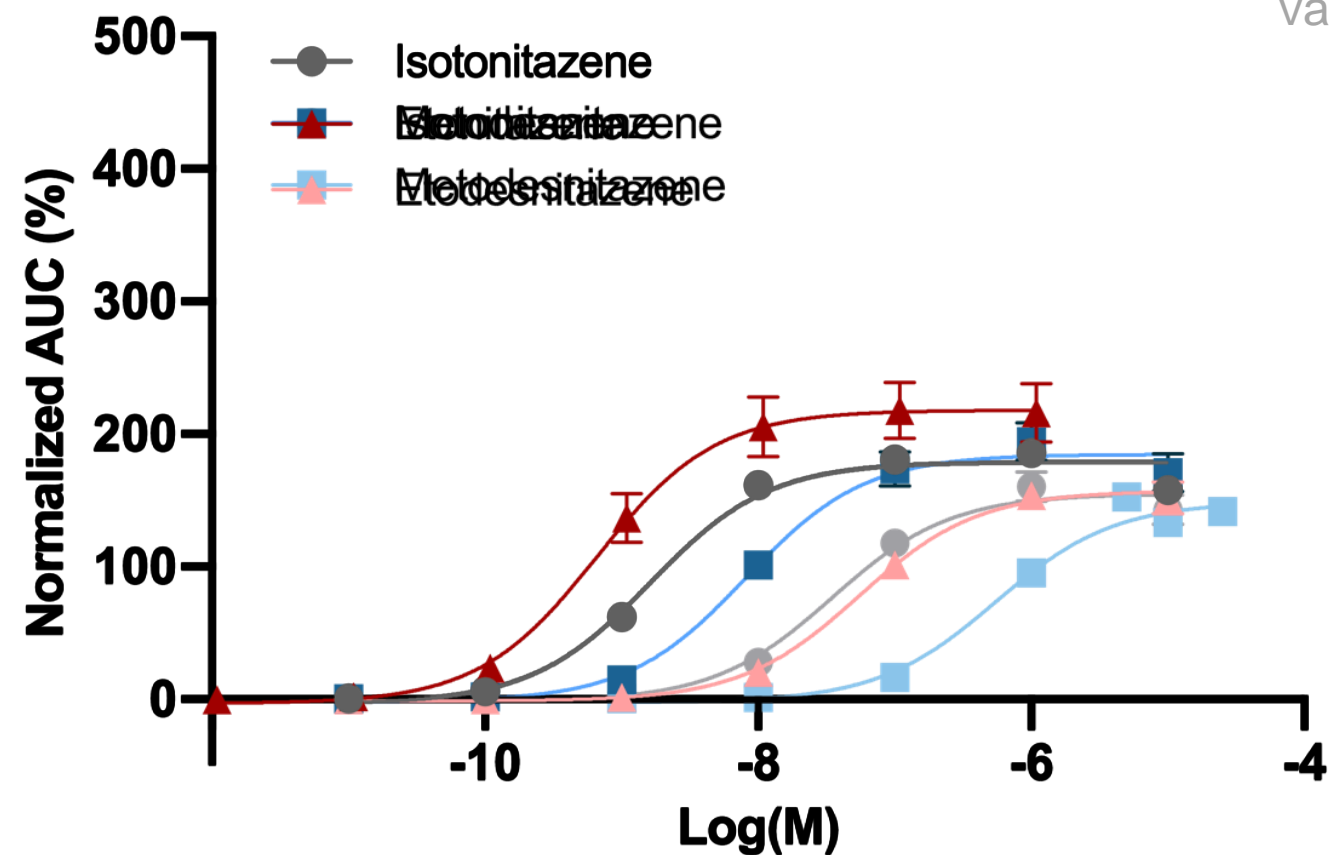
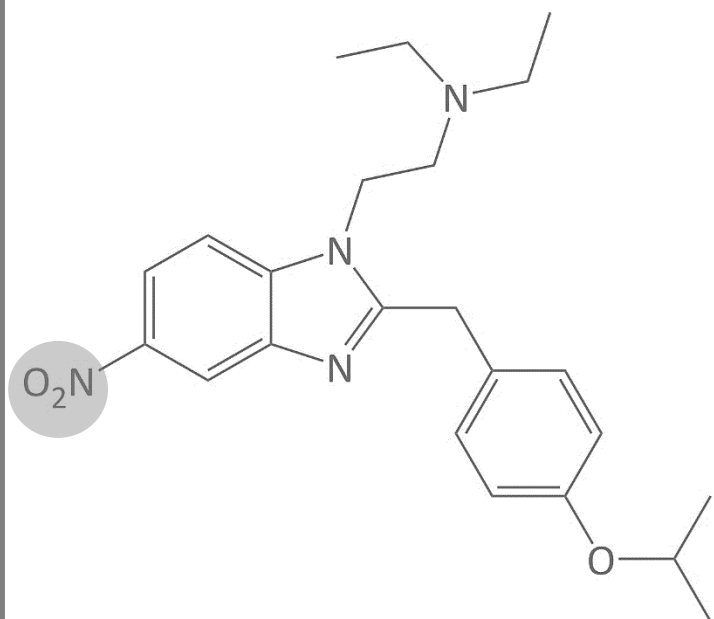




# Nitazenes: 'Desnitro' analogues

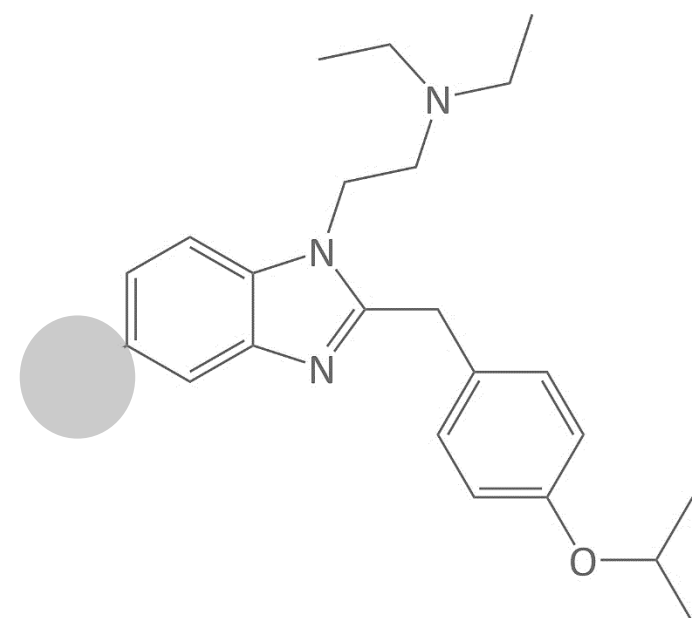


## Isotonitazene

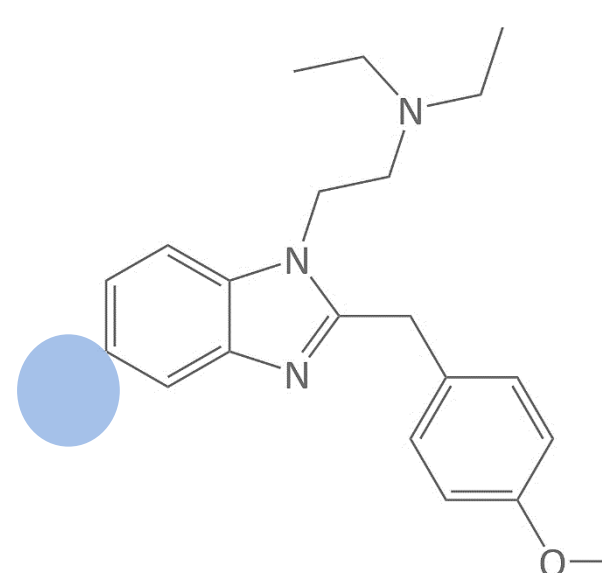


Vandeputte *et al.* (2021), ACS Chem Neurosci

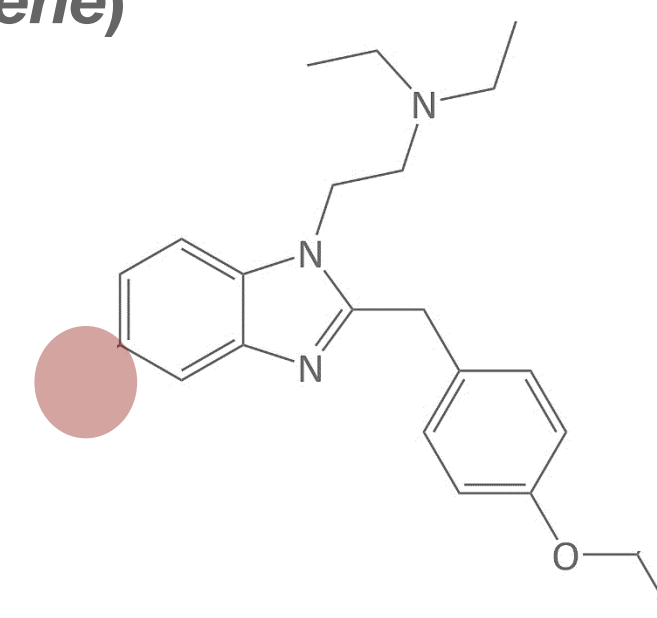
## Isotodesnitazene



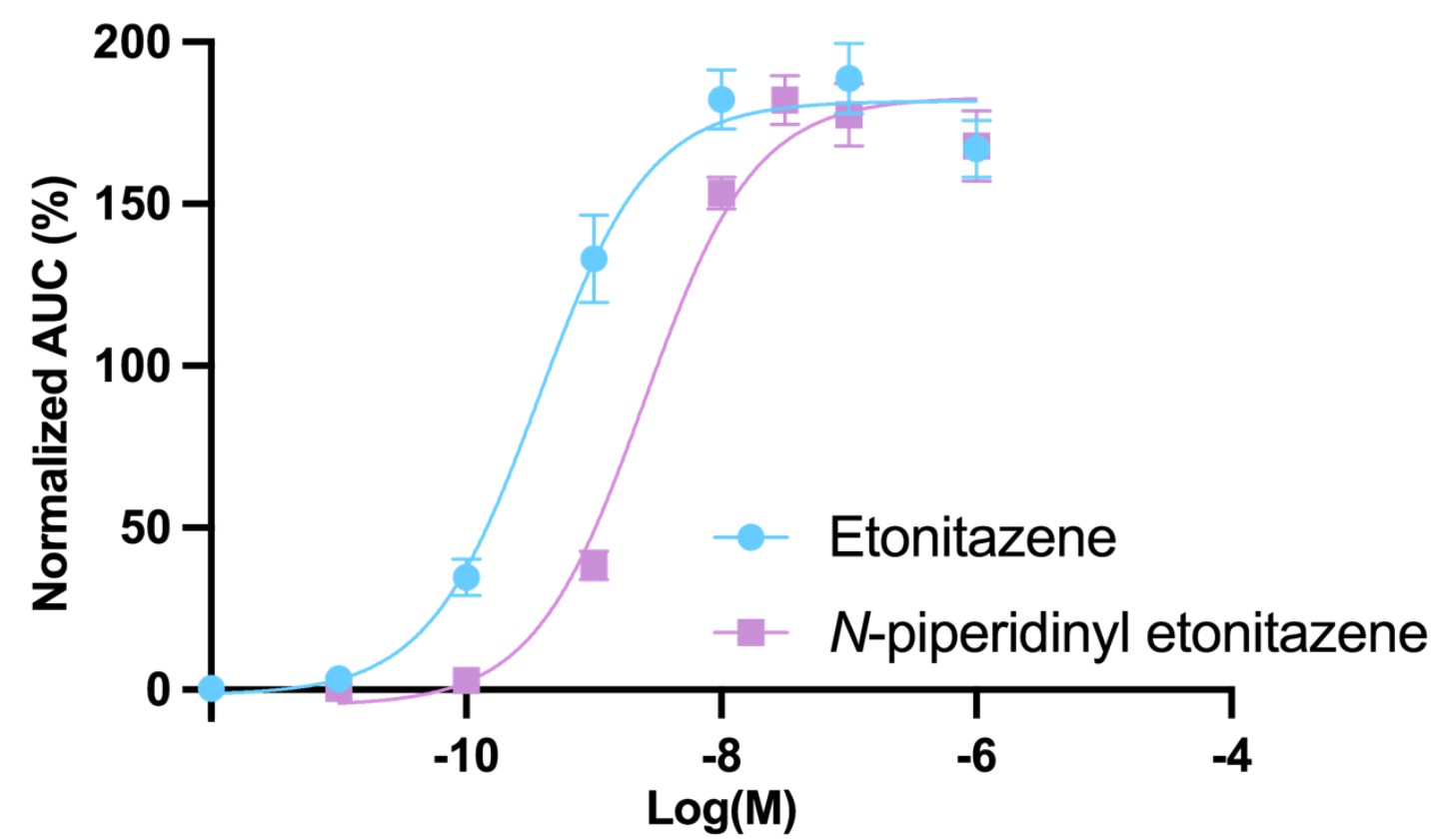
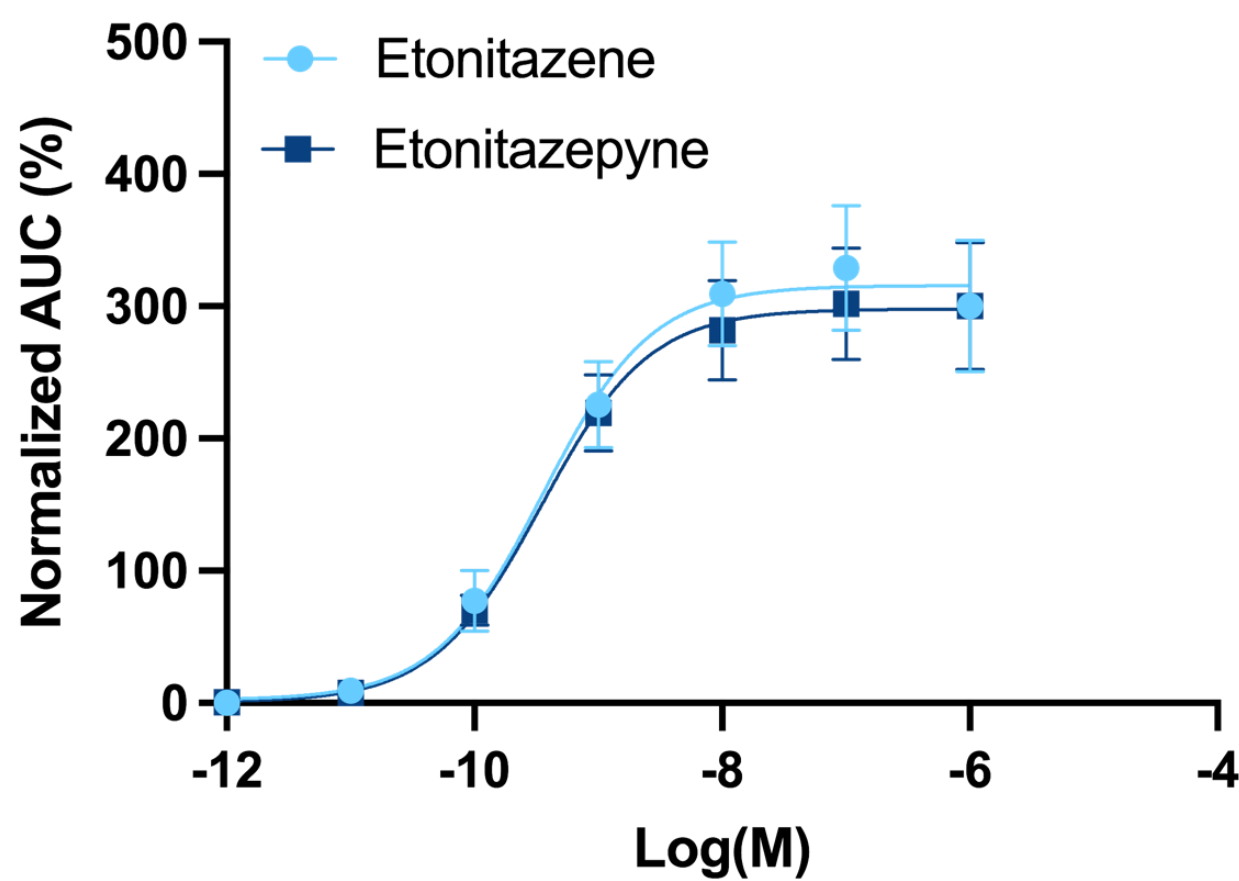
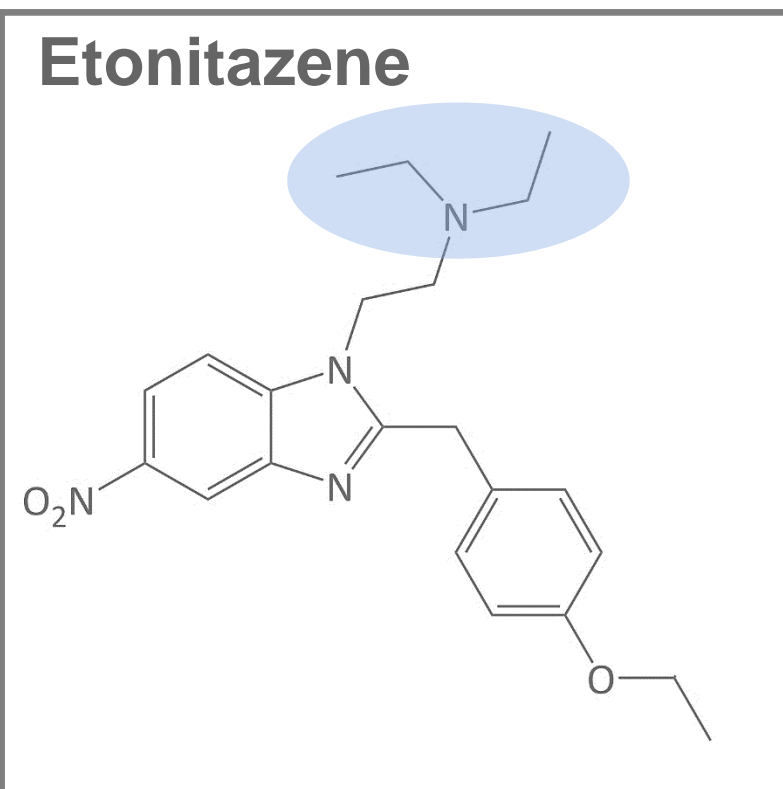
## Metodesnitazene 2020



## Etodesnitazene 2020 (*etazene*)

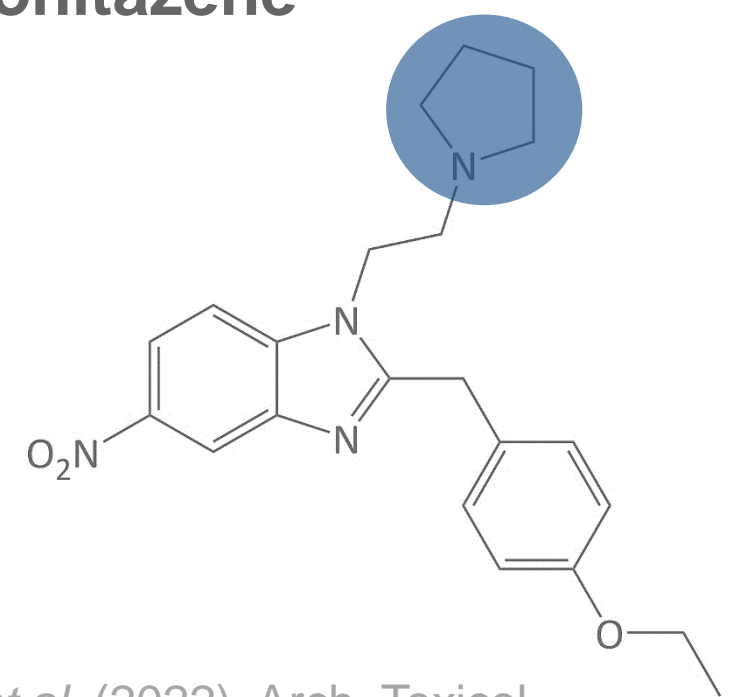


# Nitazenes: cyclic etonitazene analogues



### N-pyrrolidino etonitazene (etonitazepyne)

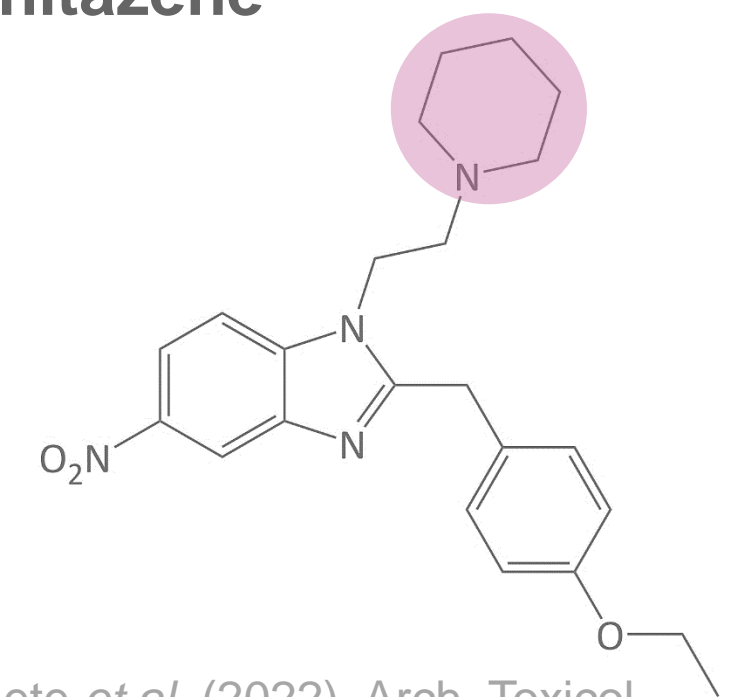
🔔 2021



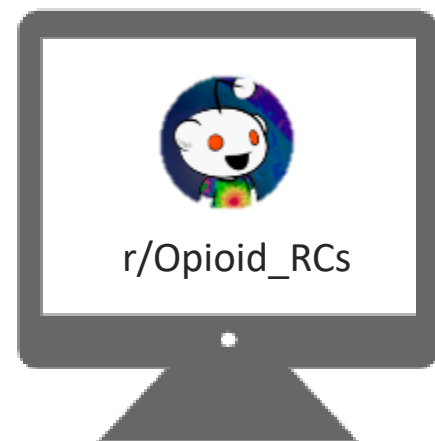
Vandeputte & Krotulski *et al.* (2022), Arch. Toxicol.

### N-piperidinyl etonitazene (etonitazepipne)

🔔 2021



Vandeputte & Verougstraete *et al.* (2022), Arch. Toxicol.

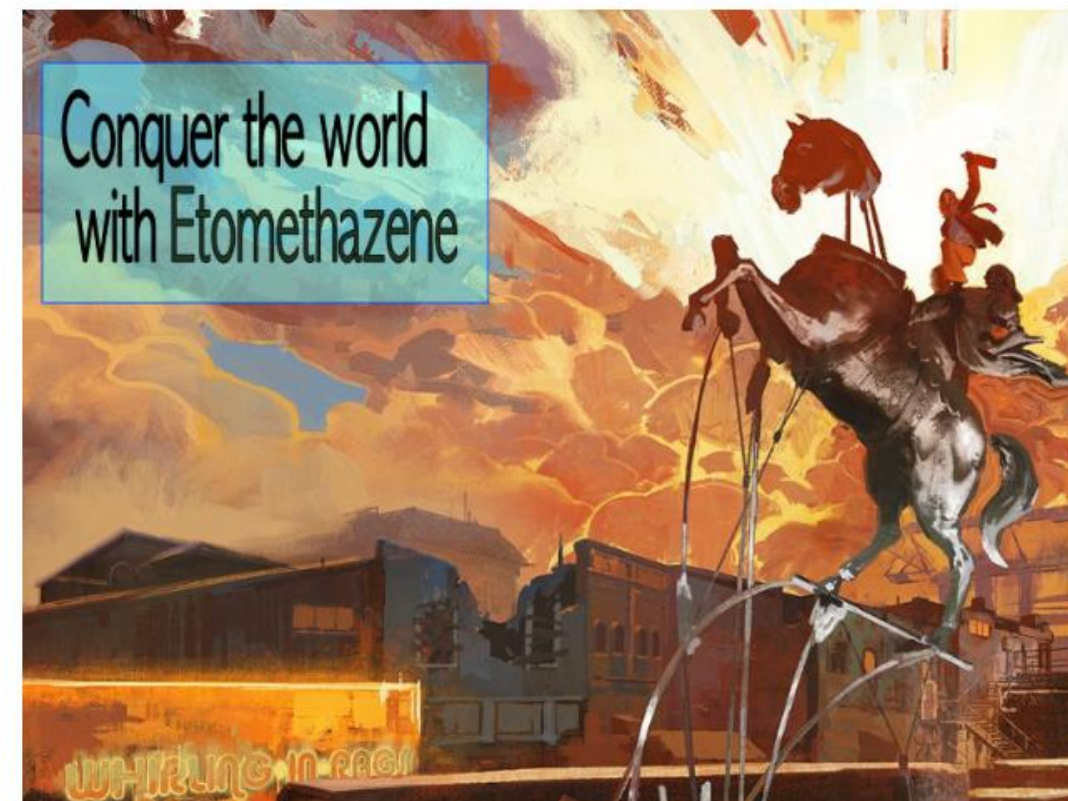


18+ r/Opioid\_RCs · Posted by u/nods\_\_ 1 month ago

metonitazepyne vs protonitazene/protonitazepyne/etonitazepyne preferences?

18+ r/Opioid\_RCs · Posted by u/MBG\_Rengar  **Mod**  3 months ago

Protonitazepyne and metonitazepyne experiences?



Conquer the world with etomethazen!

[Leave a Comment](#) / [Uncategorized](#) / [By etomethazene](#) / [June 29, 2022](#)

In low doses, it is a functional opioid. You will function well after it. You will be successful!



Increasing complexity of synthetic opioid market



*In vitro* functional characterization offers first estimation of potential harm



Nitazenes are among the most potent non-fentanyl opioids



# Marthe Vandeputte

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Ghent University  
Belgium

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 @marthevdp

Icons: thenounproject.com