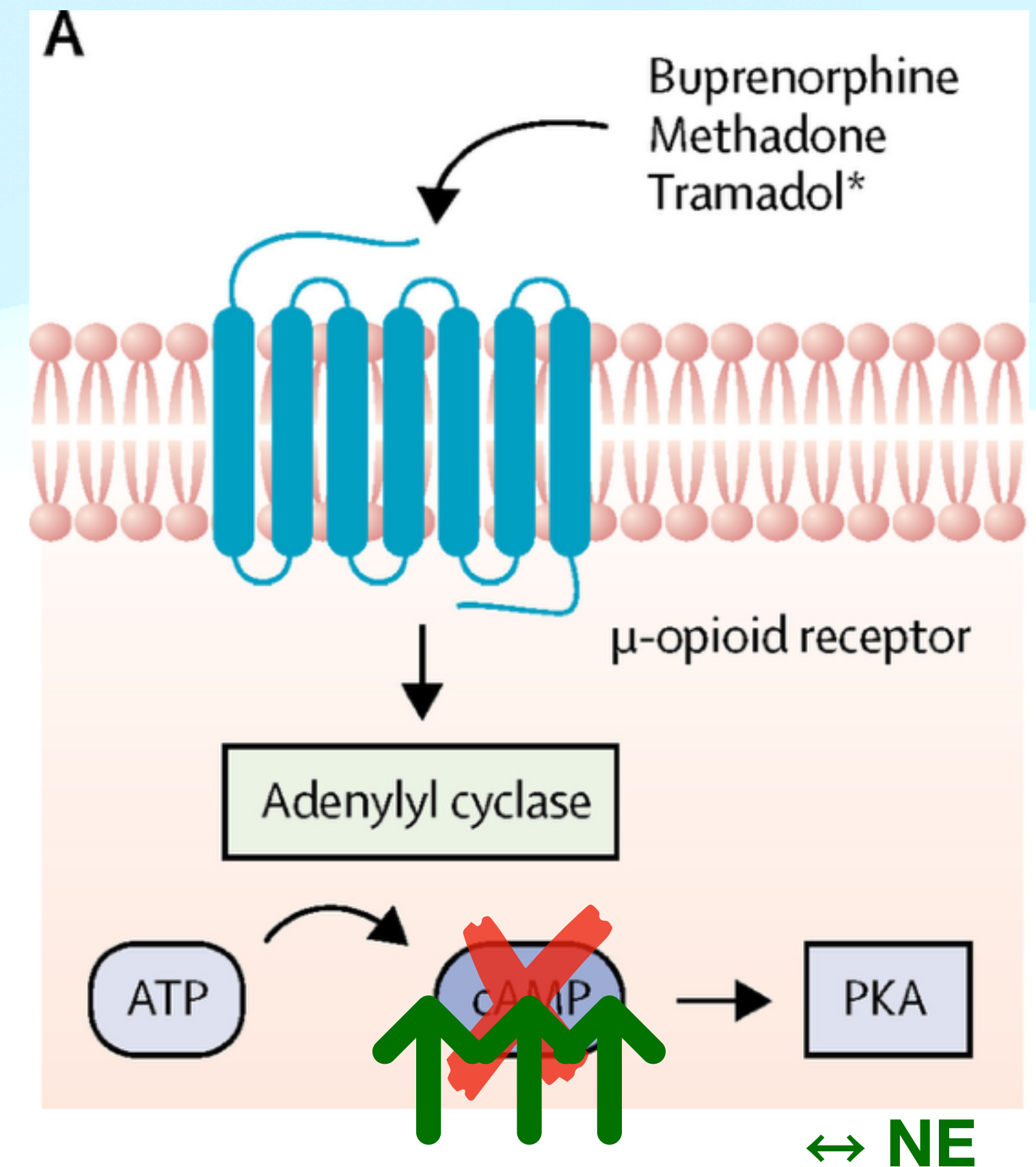


Mechanism of Opioid Withdrawal

Repeated Use → Tolerance

Locus coeruleus neurons upregulate the cAMP pathway

- ↔ NE
- ↔ DA
- require baseline opioid levels to prevent withdrawal



Mechanism of Opioid Withdrawal

Abrupt Cessation → Withdrawal

Locus coeruleus neurons continue to upregulate the cAMP pathway without opioid inhibition

- ↑ NE
- ↓ DA
- ↑ vascular tone, muscle tone

