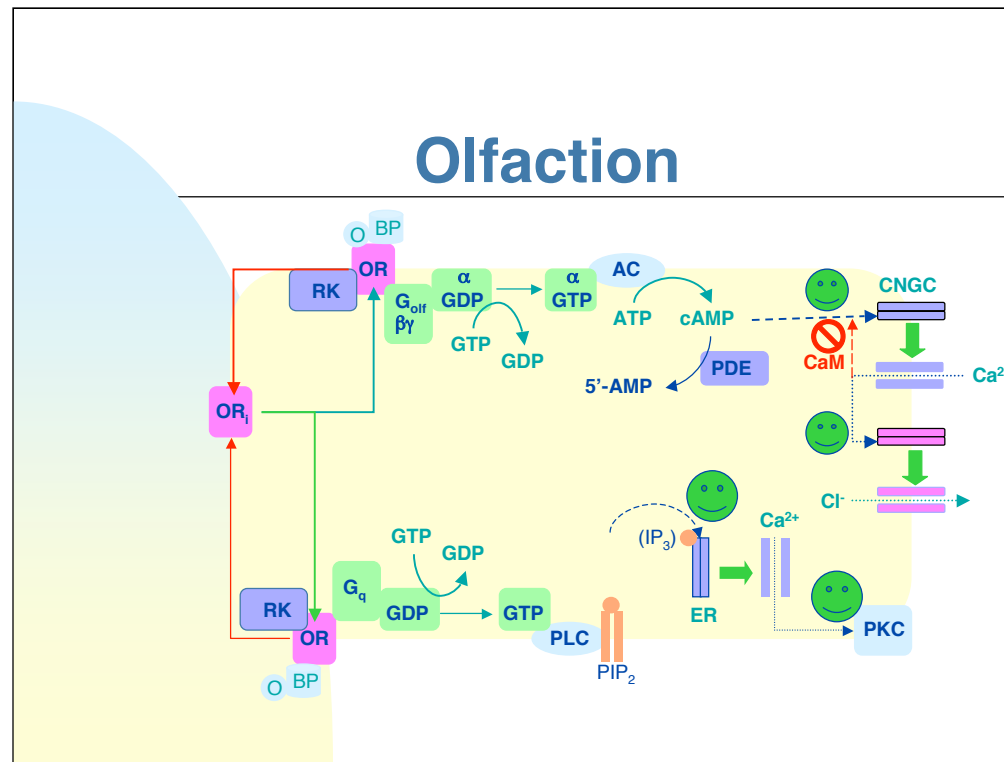


# Olfaction

- **Olfaction signaling**
- **Cyclic nucleotide gated channels**
- **Inositol trisphosphate/Ca<sup>2+</sup>/Protein kinase C**

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**OR:** odorant receptor

**BP:** binding protein

**GDP:** guanosine diphosphate

**AC:** adenylyl cyclase

**cAMP:** cyclic adenosine monophosphate

**CaM:** calmodulin; decreases CNGC sensitivity

**5'AMP:** 5'-adenosine monophosphate

**PLC:** phospholipase C

**PIP<sub>2</sub>:** phosphatidylinositol-4,5-bisphosphate

**PKC:** protein kinase C; increases sensitivity of AC and CNGC

There appears to be a 3rd pathway that utilizes a guanylyl cyclase (cGMP) receptor.

Odorant cells are one of the few cells where [Cl<sup>-</sup>] is greater inside than outside.

β-arrestin binds the phosphorylated receptor **AND** appears to recruit phosphodiesterase to degrade the cAMP signal

Kallmann syndrome, a rare hypogonadotropic hypogonadism

**O:** odorant

**G<sub>olf</sub>:** G protein

**GTP:** guanosine triphosphate

**ATP:** adenosine triphosphate

**CNGC:** cyclic nucleotide-gated channel

**PDE:** phosphodiesterase

**RK:** receptor kinase

**ER:** endoplasmic reticulum

**IP<sub>3</sub>:** inositol-1,4,5-trisphosphate

# Review Questions

- **Which ions and ion channels are used for olfaction?**
- **Which signal transduction pathways are used for olfaction (enzymes, second messengers, receptors)?**