

Hydrophilic ligands (hormones)

Each ligand may activate more than one second messenger pathway and this depends on the type of receptor that it binds to it

Almost all hormones which activate several second messenger pathways they bind to G-PCRs (G-Protein coupled receptors)

Second messenger pathways

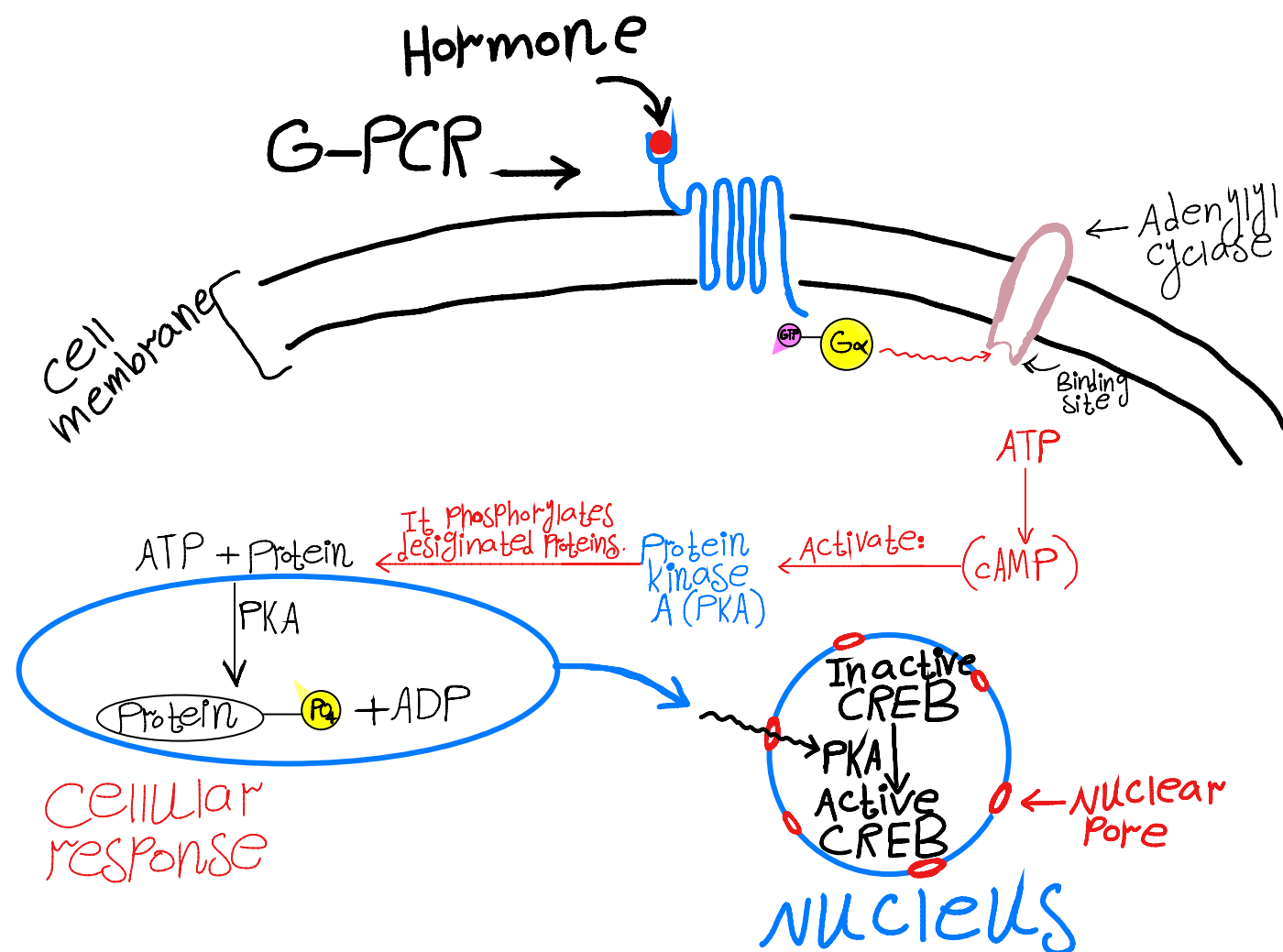
cAMP

cGMP

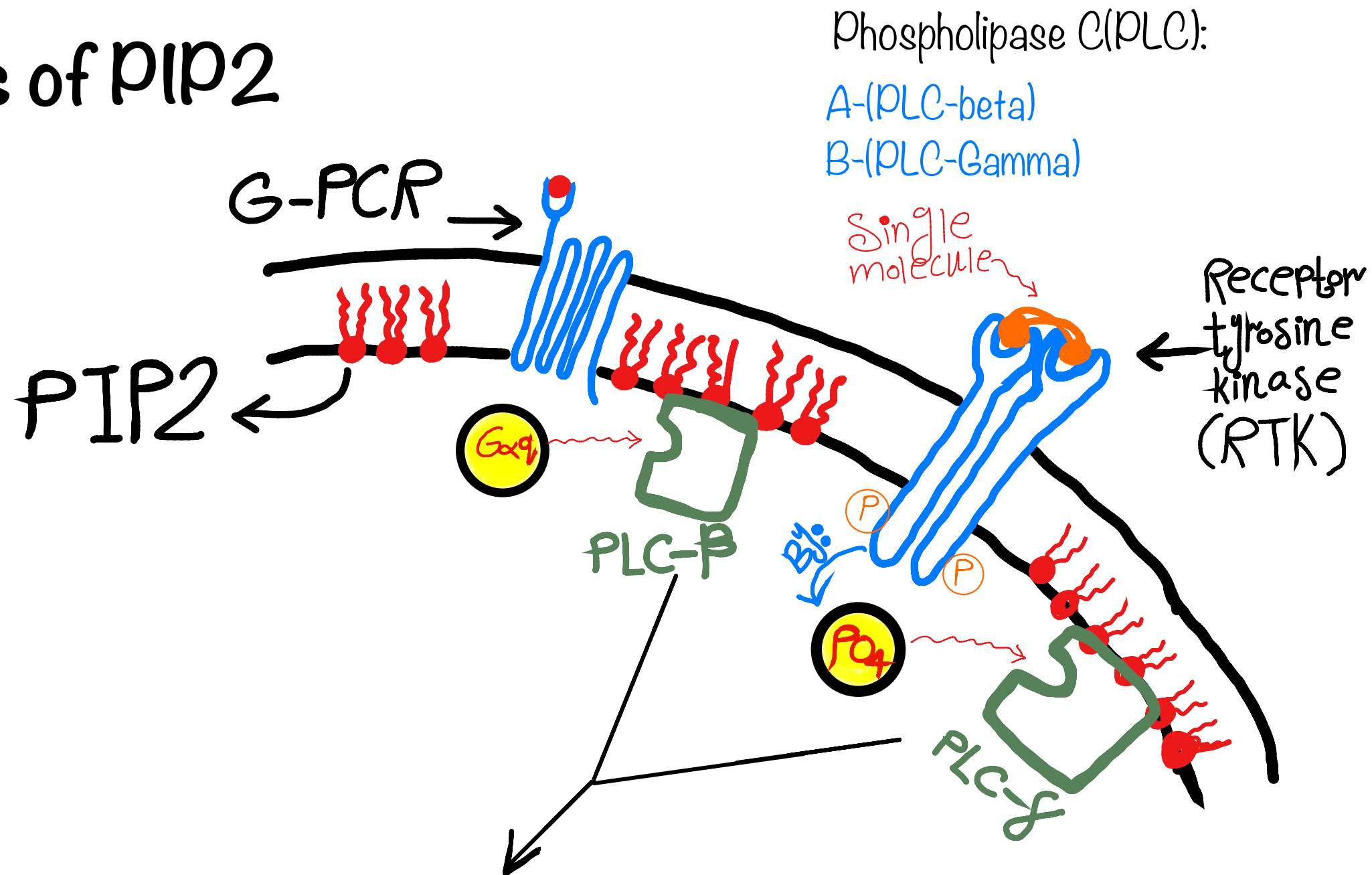
Hydrolysis of PIP₂

Calcium-Calmodulin complex

A-cAMP pathway



B-Hydrolysis of PIP₂



Both hydrolyze **pip₂** into :

IP₃(water soluble)

Flow into the cytosol

It brings the deposited calcium ions from **ER**

DAG(Lipid soluble)

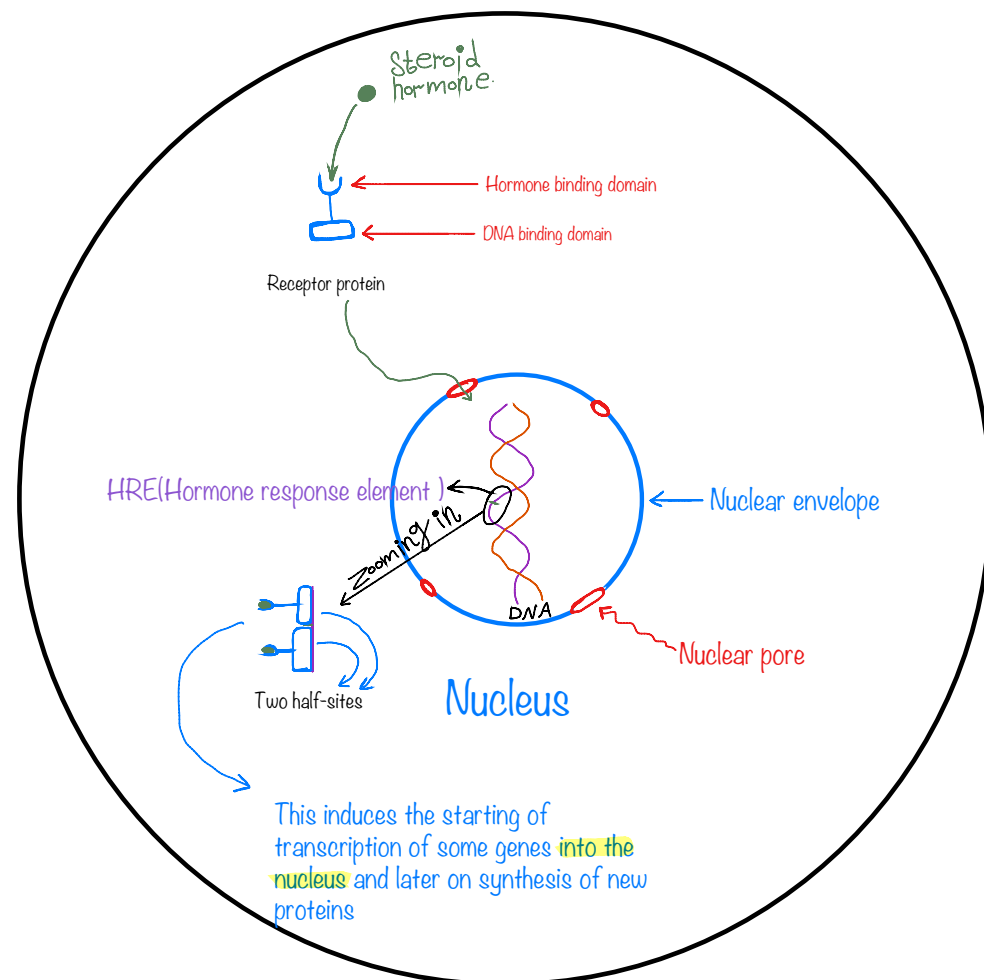
Remain in the cell membrane

It causes to activate the **Protein kinase C(PKC)**

The genetic effect of the **Lipophilic hormones** once they diffuse into the target cells

Steroid hormones

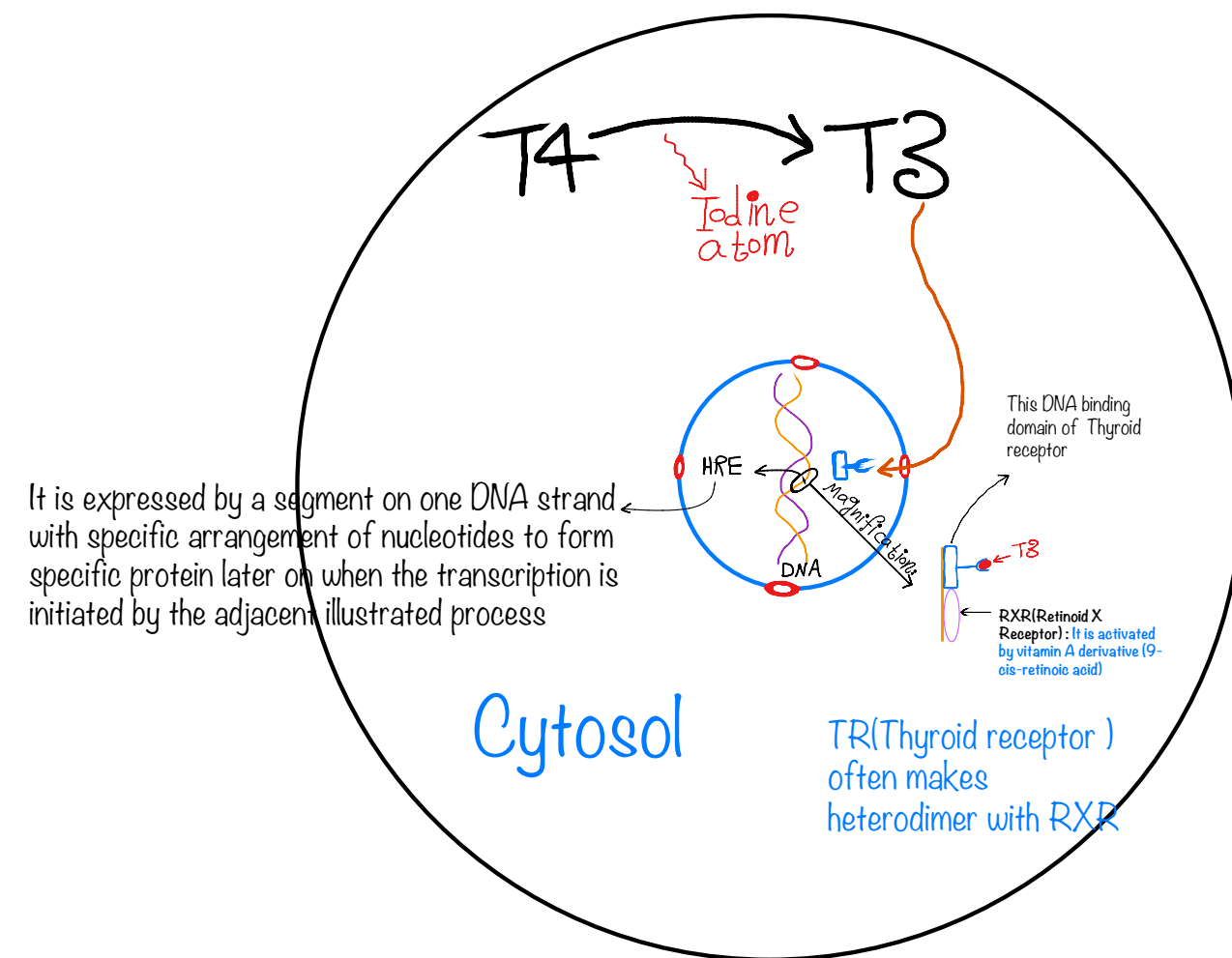
Their receptors : **Cytoplasmic receptors**



Target cell

Thyroid hormones

Their receptors : **Nuclear receptors**



Target cell