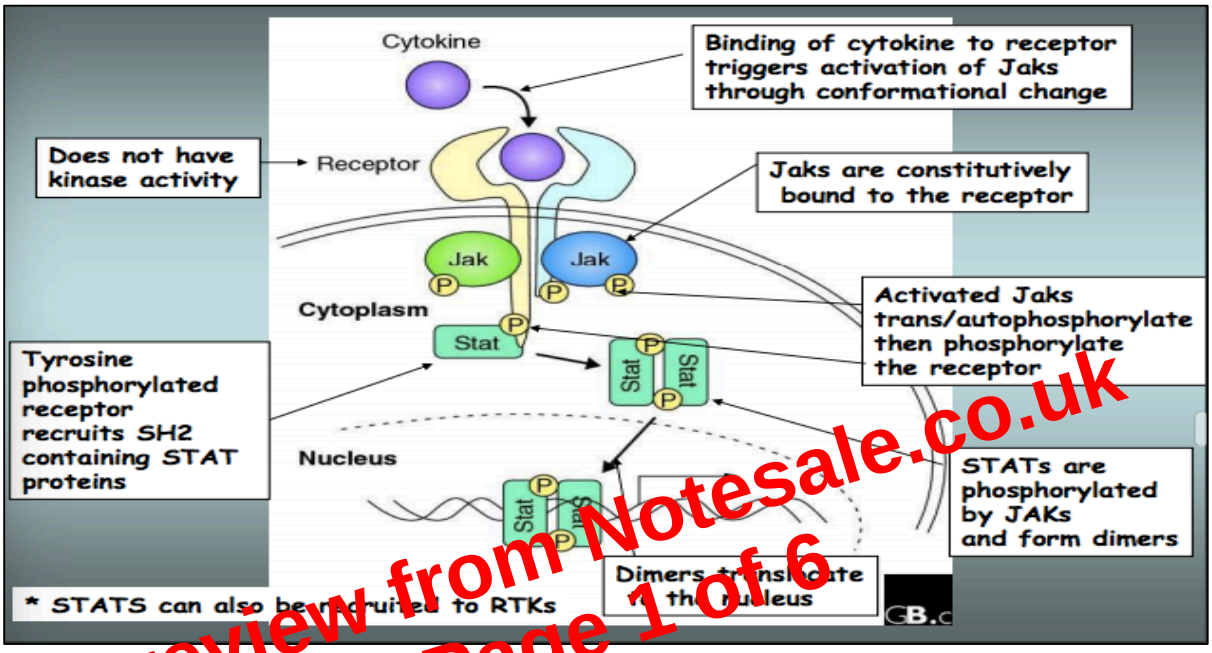
INTRACELLULAR SIGNALLING II

JAK-STAT Pathway:

1. Some cytokine receptors have **no kinase activity: JAKs** are non-receptor tyrosine kinases.
2. These particular receptor proteins do not carry covalently associated tyrosine kinase domains and instead **form nonconvalent complexes with tyrosine kinases of the Jak class.**
3. Activated JAKS phosphorylate around 10 different substrates including signal transducers and activators of transcription (**STATs**).



4. STATs can form homo and heterodimers, and this allows unique response elements for **different STAT dimers** due to the different dimer combinations of the STATs activated.

Ligand	Receptor associated JAK	STAT activated	Response
γ-interferon	JAK1	STAT1	Activates macrophages Increases MHC protein
Prolactin	JAK2	STAT5	Stimulates milk production
Growth hormone	JAK2	STAT1 and STAT5	Stimulates growth via production of IGF-1