MCMP 422
Spring 2006

Study Guide 1

Study Guide to the Structure of Immune Molecules

Protein	Subunits	Regions	Designation	Comments
Ig (Ab)	light chains (2)	V and C	V_L, C_L	Each V region contains 3 CDRs and is encoded by V region and J region gene segments. Two C region gene segments: λ and κ
	heavy chains (2)	V and C	V_H, C_H	Each V region contains 3 CDRs and is encoded by V region, D region, and J region gene segments. Five C region genes: α, δ, ε, γ, μ. Gamma and alpha have subclasses.
BCR	IgM (monomeric)	V and C		Antigen binding unit of the BCR (B cell antigen receptor) contains H and L chains
	IgD	V and C		Antigen binding unit of the BCR (B cell antigen receptor) contains H and L chains
	Igα	-		Signaling subunit of the BCR, invariant (does not varying in amino acid sequence)
	Igβ	-		Signaling subunit of the BCR, invariant (does not varying in amino acid sequence)
TCR	α chain	V and C	V_α, C_α	Each V region contains 3 CDRs, together with the β chain makes up the antigen binding subunit of the TCR. V region is encoded by V region and J region gene segments.
	β chain	V and C	V_β, C_β	Each V region contains 3 CDRs, together with the α chain makes up the antigen binding subunit of the

				TCR. V region is encoded by V region, D region and J region gene segments
Protein	Subunits	Regions	Designation	Comments
TCR	γ subunit	-		Signaling subunit of the TCR, invariant (does not varying in amino acid sequence). Component of CD3
	δ subunit	-		Signaling subunit of the TCR, invariant (does not varying in amino acid sequence). Component of CD3
	ε subunit	-		Signaling subunit of the TCR, invariant (does not varying in amino acid sequence). Component of CD3
	ζ subunit	-		Exists as a homodimer. Signaling subunit of the TCR, invariant (does not varying in amino acid sequence)
MHC I	α chain	contains varying sequences (α_1 and α_2) and an invariant region (α_3)	α_1, α_2, α_3	α_1 and α_2 form peptide binding site. The invariant α_3 region binds CD8
	β2 Micro-globulin	-		Invariant, noncovalently associates with α chain
MHC II	α chain	variable region invariant region	α_1 α_2	Together with β forms peptide binding site.
	β chain	variable region invariant region	β1 β2	Together with α_1 forms peptide binding site

Protein	Subunits	Regions	Designation	Comments
CD4	-	-	-	One single invariant protein. Found on the surface of helper T cells, binds the invariant β2 region of MHC II
CD8	α chain	invariant	-	Found on the surface of cytotoxic T cells, binds α3 region of MHC I, combines with β chain to form CD8
	β chain	invariant	-	Found on the surface of cytotoxic T cells, combines with α chain to form CD8