

Bioinformatique et biostatistiques appliquées à la biologie

Enseignements d'Immuno-informatique-
IMGT®, the international ImMunoGeneTics information system®

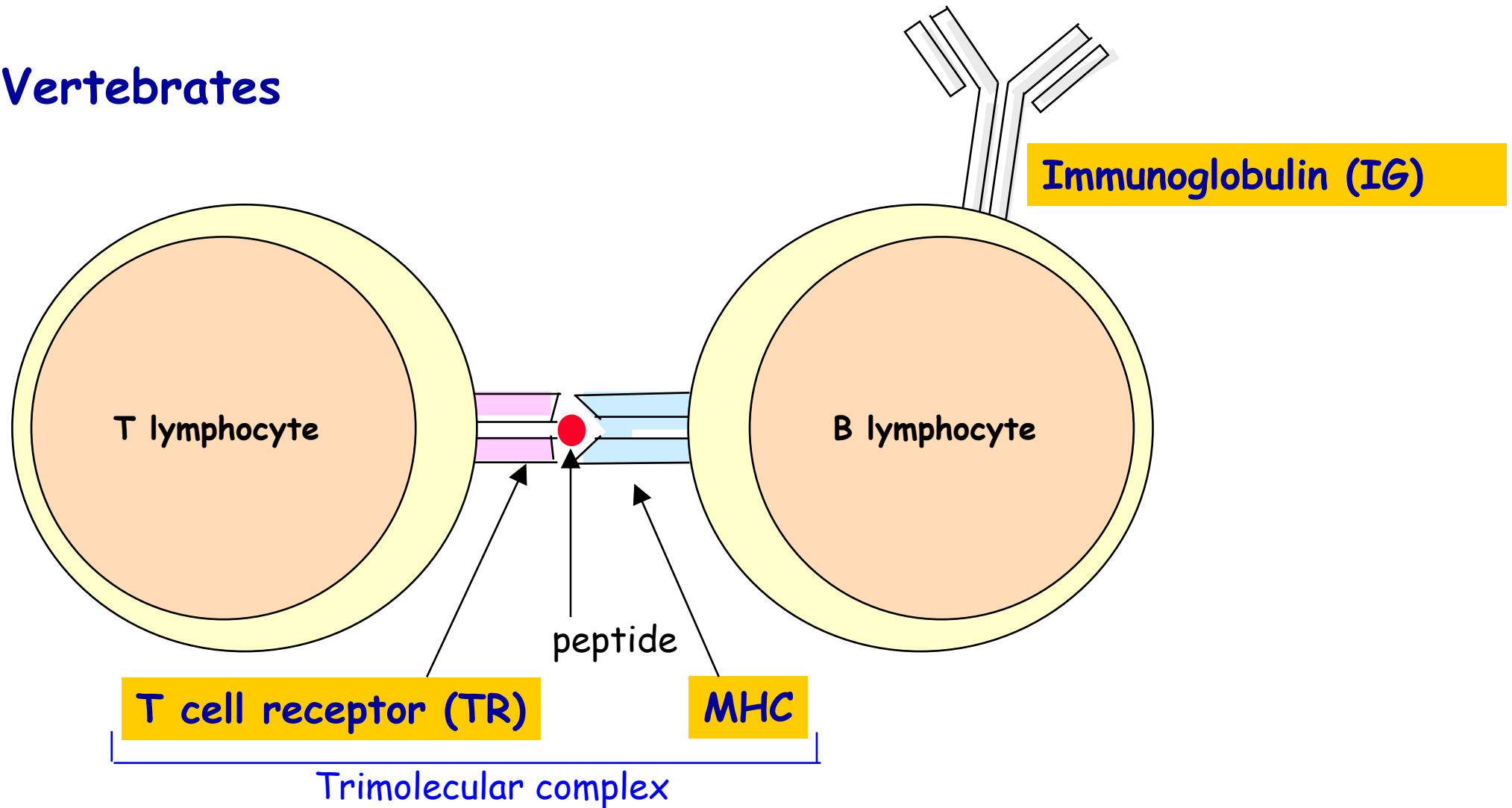
Séances : Vendredi 9 Novembre

Souphatta SASORITH

Structures 3D des complexes
trimoléculaires TR/pMHC

IMGT®: the adaptive immune response

Vertebrates



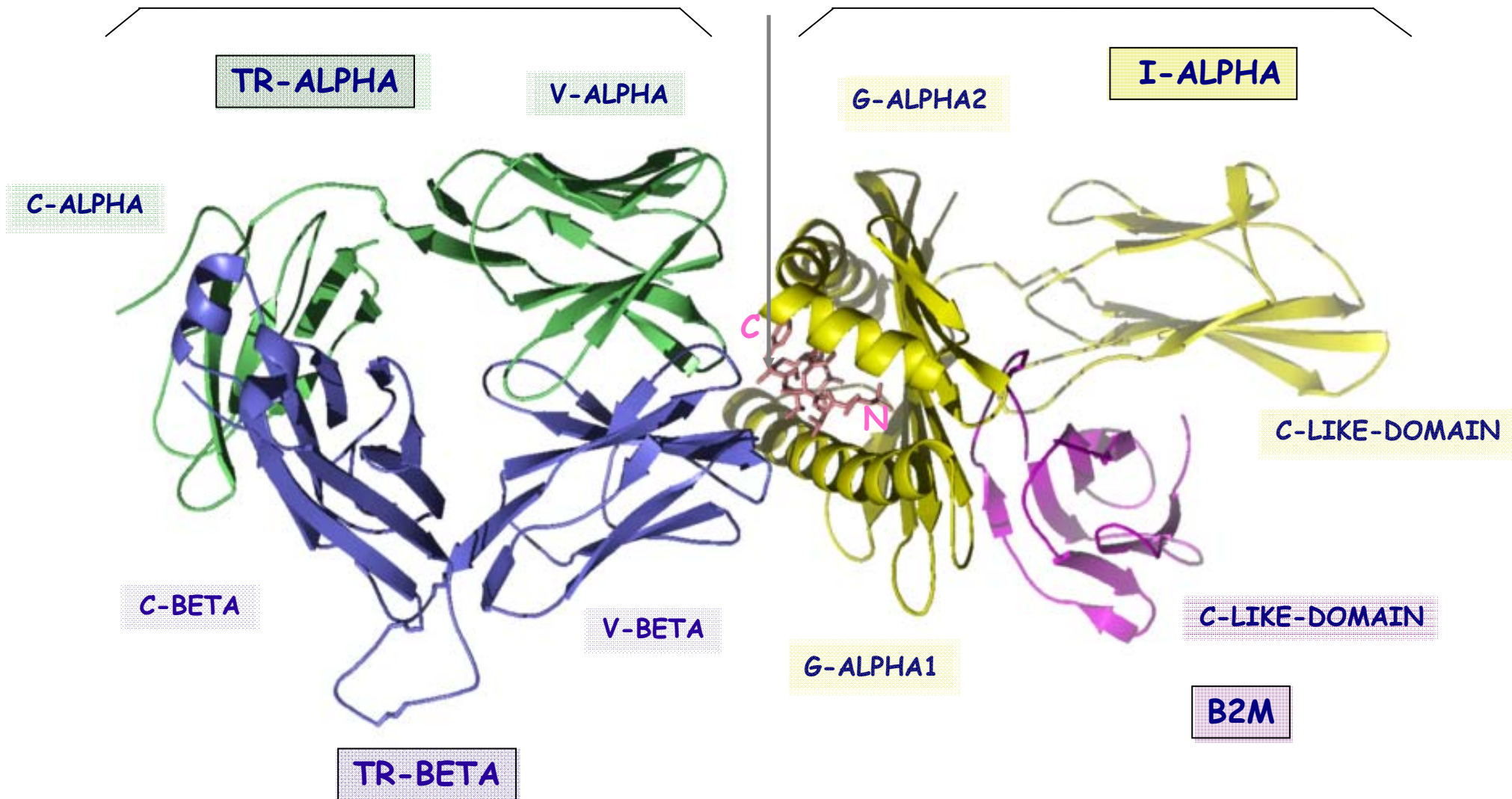
Presentation of peptides by the MHC to the T cell receptors (TR) at the surface of T cells.
→ characterization of the TR/peptide/MHC trimolecular complexes (TR/pMHC) is crucial

TR/peptide/MHC complex

T cell receptor (TR)

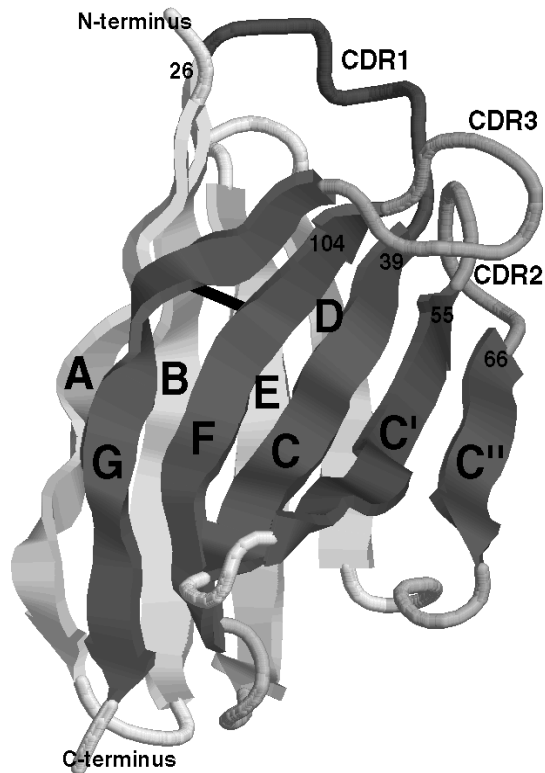
Peptide

MHC-I

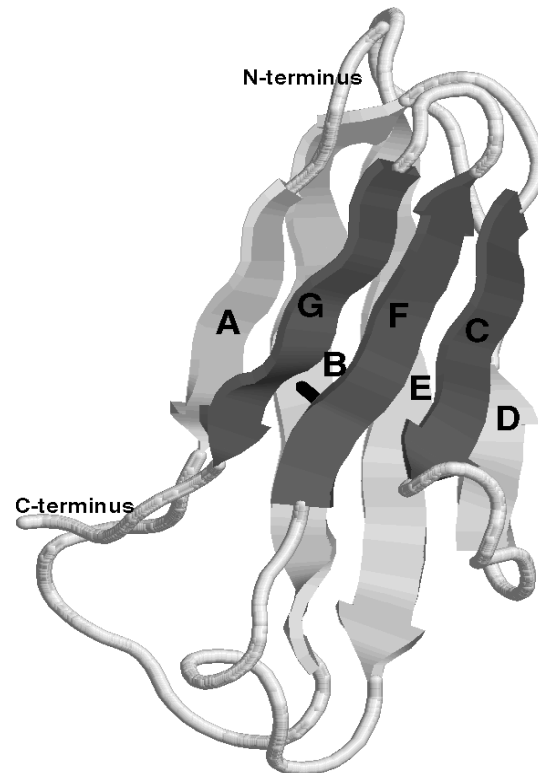


Structural domains (IG,TR et MHC)

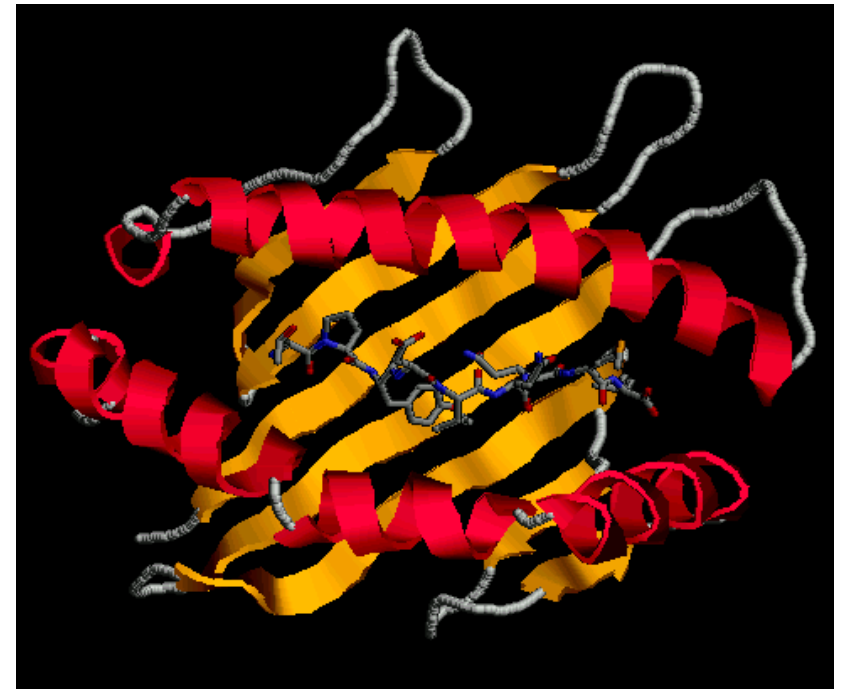
V-DOMAIN (IG, TR)
AND
V-LIKE-DOMAIN
(other than IG, TR)



C-DOMAIN (IG, TR)
AND
C-LIKE-DOMAIN
(other than IG, TR)



G-DOMAIN (MHC)
AND
G-LIKE-DOMAIN
(other than MHC)

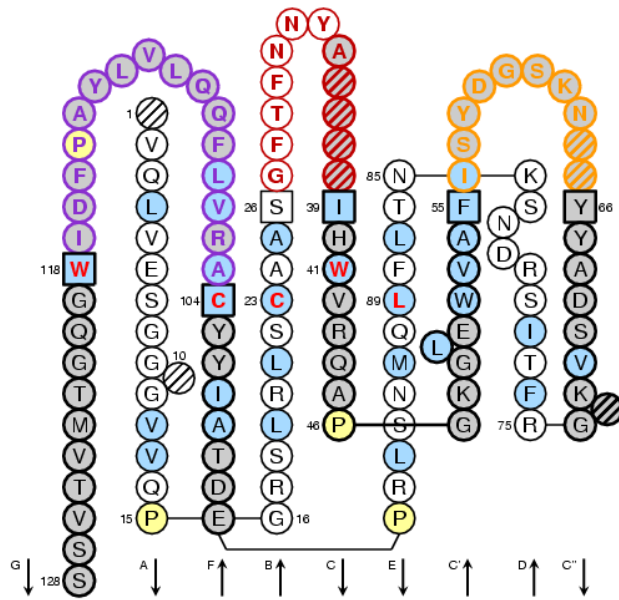


Immunoglobulin superfamily (IgSF)

MHC superfamily (MhcSF)

V-LIKE-DOMAIN

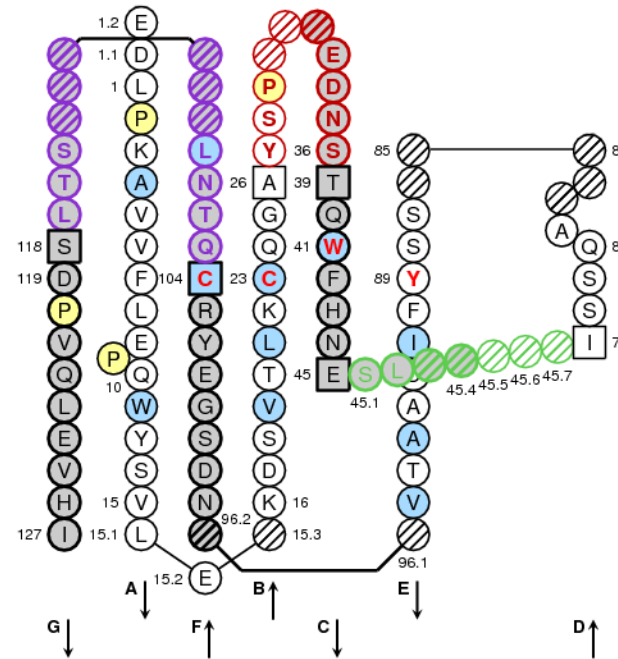
MOG



Duprat, E. et al., *Recent Res. Develop. Human Genet.*, 2, 111-136 (2004)

C-LIKE-DOMAIN

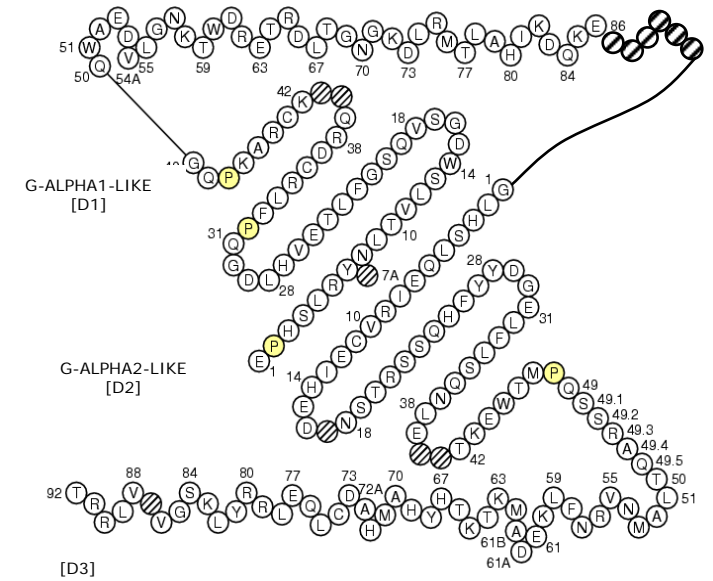
FCGR3B



Bertrand, G. et al., *Tissue Antigens*, 64, 119-131 (2004)

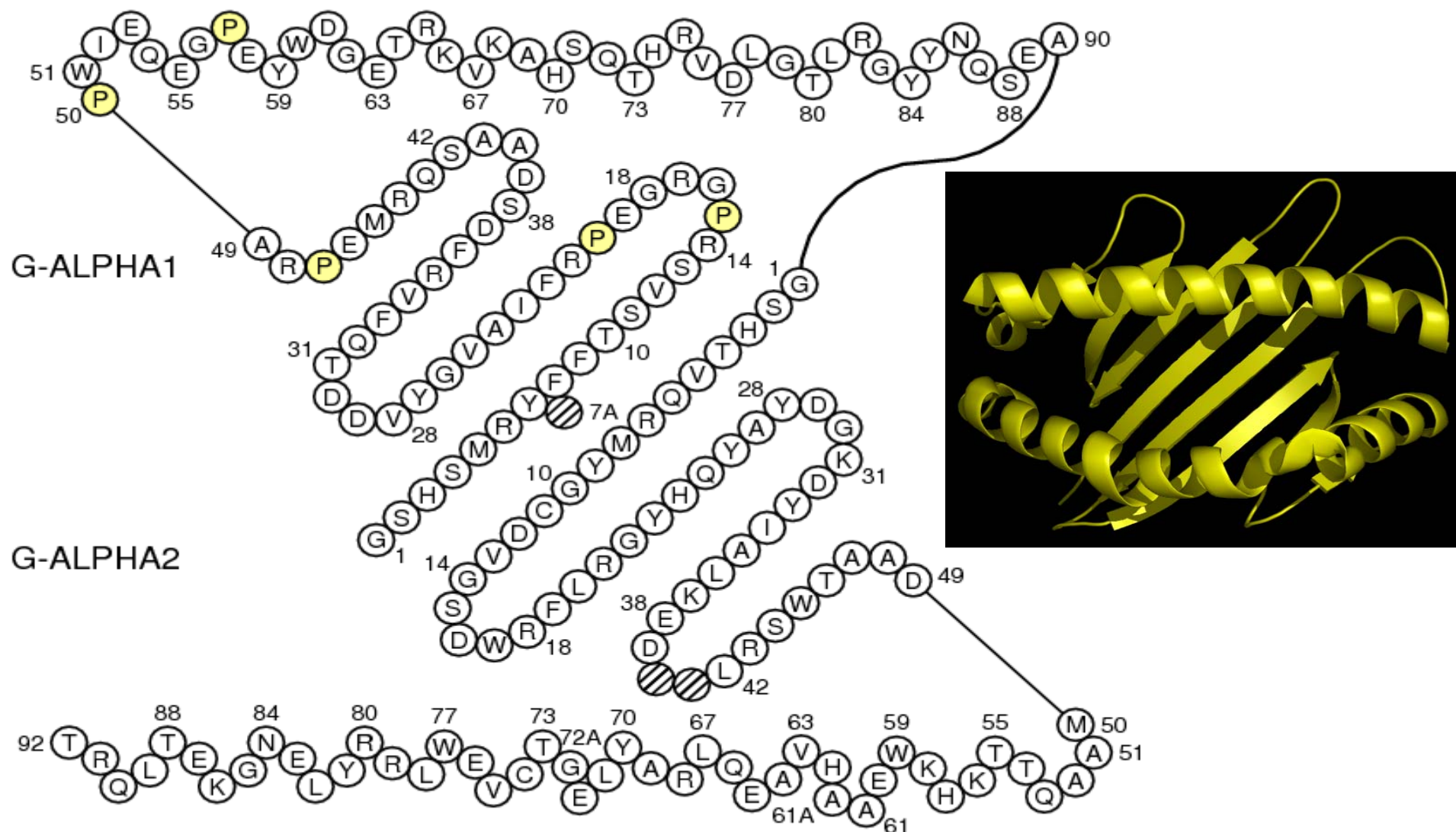
G-LIKE-DOMAIN

MICA

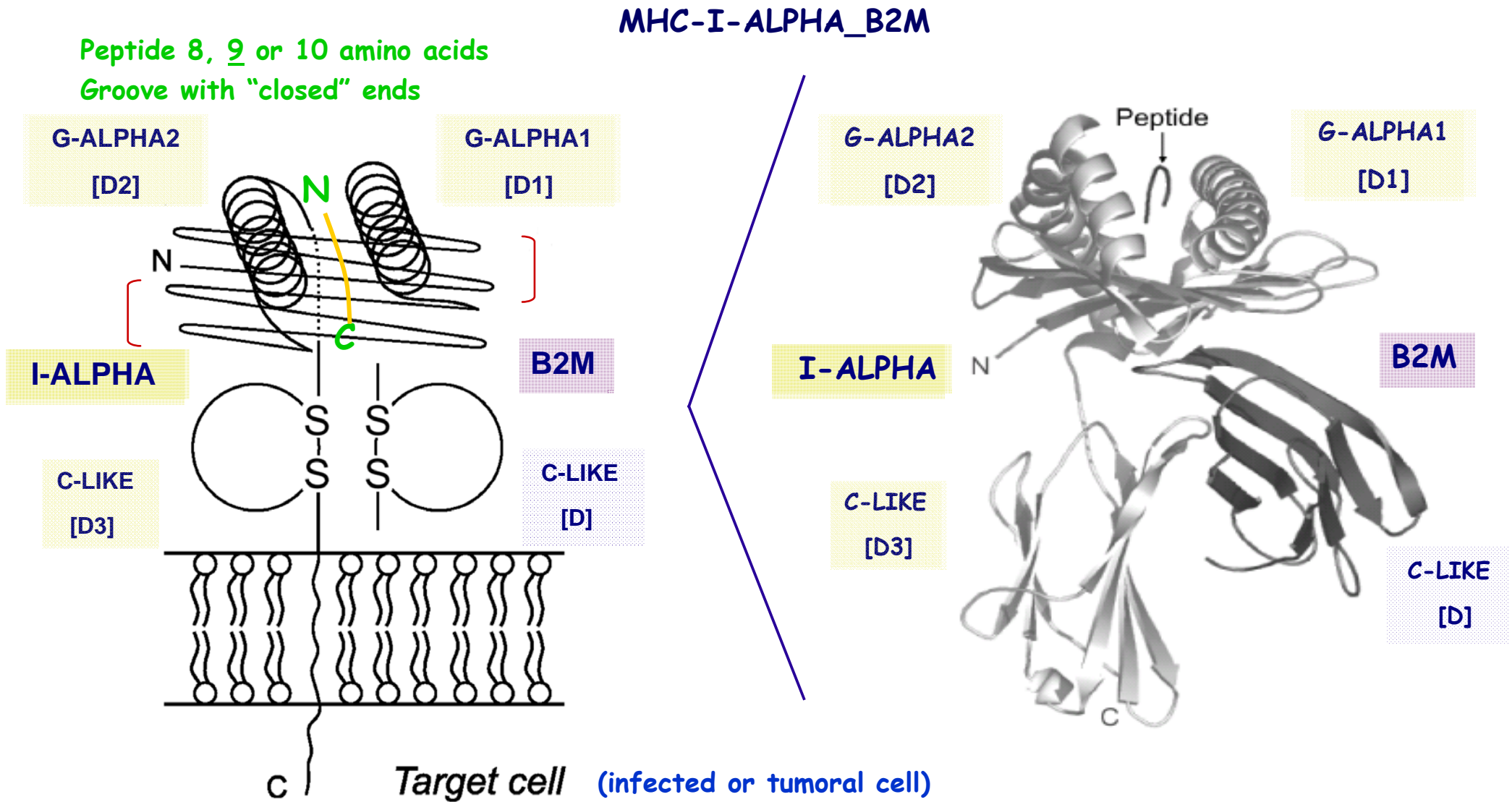


Frigoul, A. et al., *Recent Res. Develop. Human Genet.*, 3, 95-145 (2005)

G type domain and IMGT Collier de Perles



MHC-I chains and domains



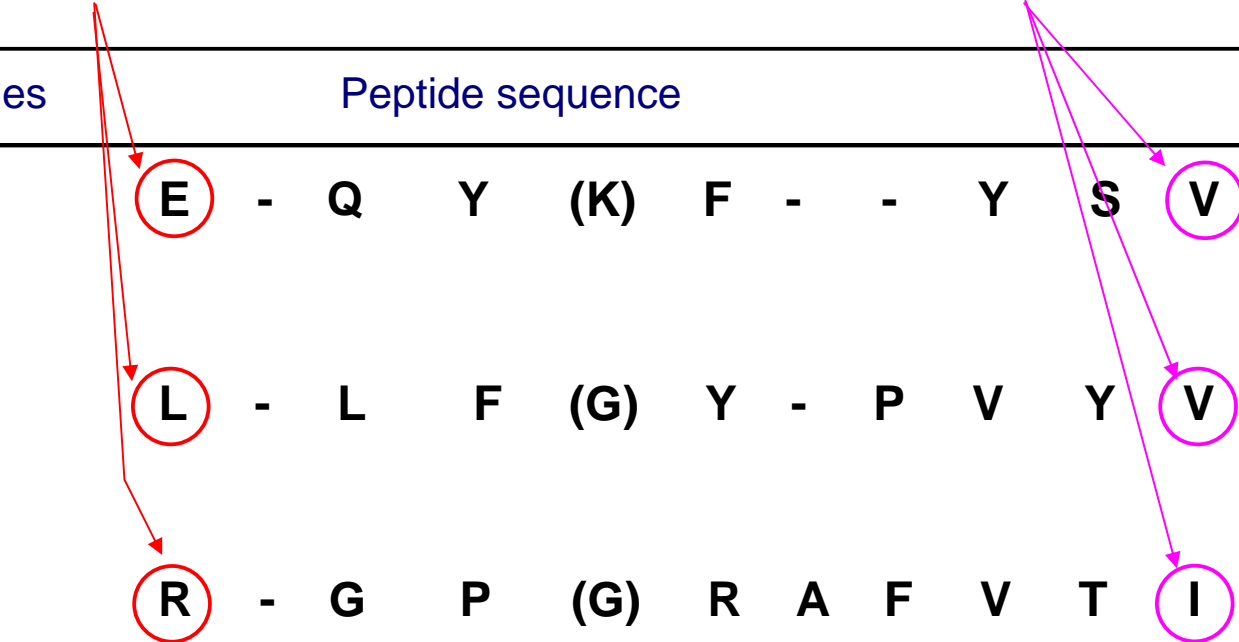
Lefranc et al., Dev. Comp. Immunol. 29, 917-938 (2005)

Peptide alignment

	Number of residues	Peptide sequence
MHC-I	8 amino acids 1jtr_Q	E - Q Y (K) F - - Y S V
	9 amino acids 1ao7_C	L - L F (G) Y - P V Y V
	10 amino acids 1bii_P	R - G P (G) R A F V T I
IMGT pMHC contact sites		C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11
MHC-II	13 amino acids 1j8h_C	P K Y V K Q (N) T - - L K L A T

Pocket A

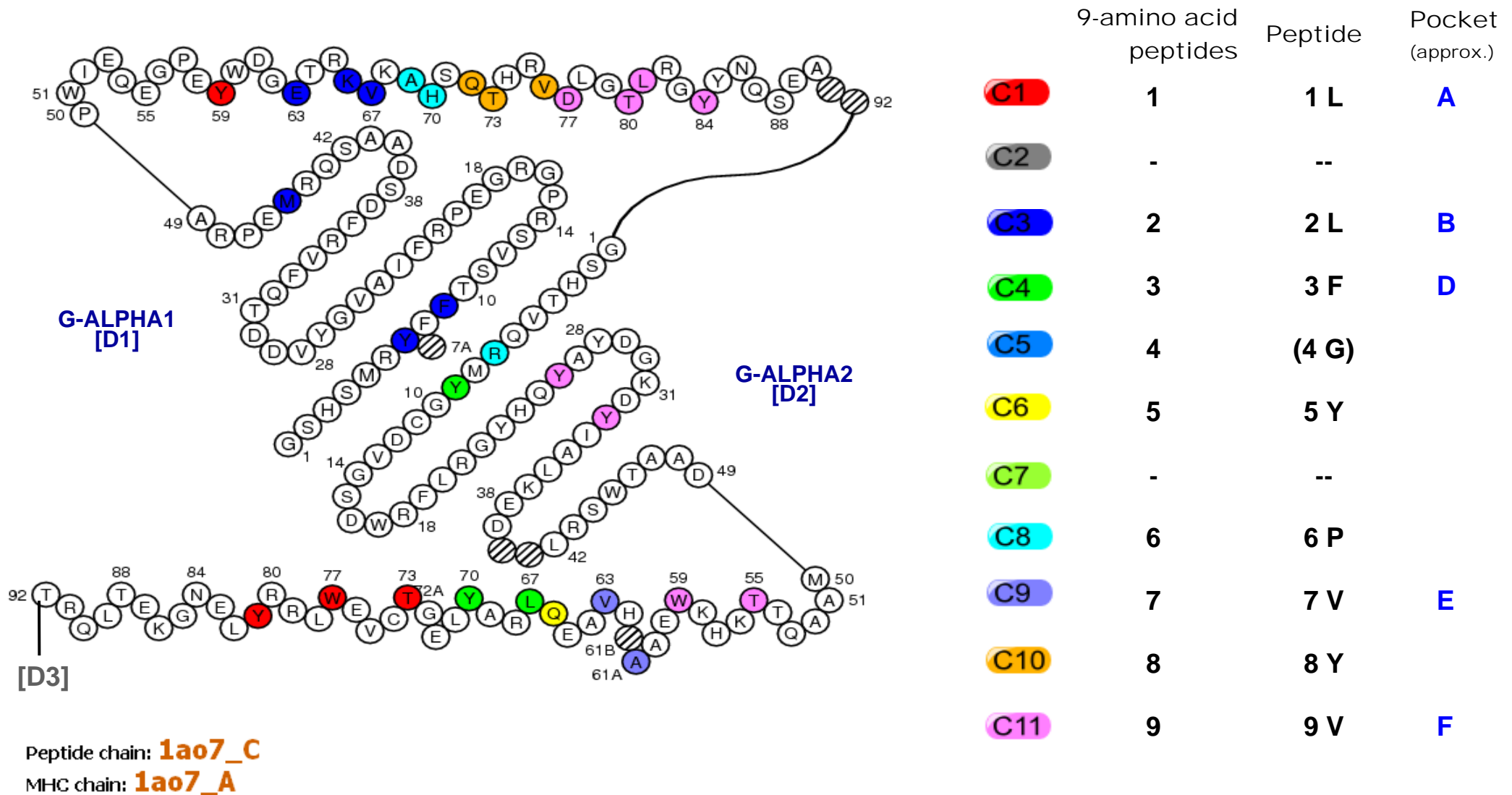
Pocket F



Kaas and Lefranc, In Silico Biology 5, 505-528 (2005)

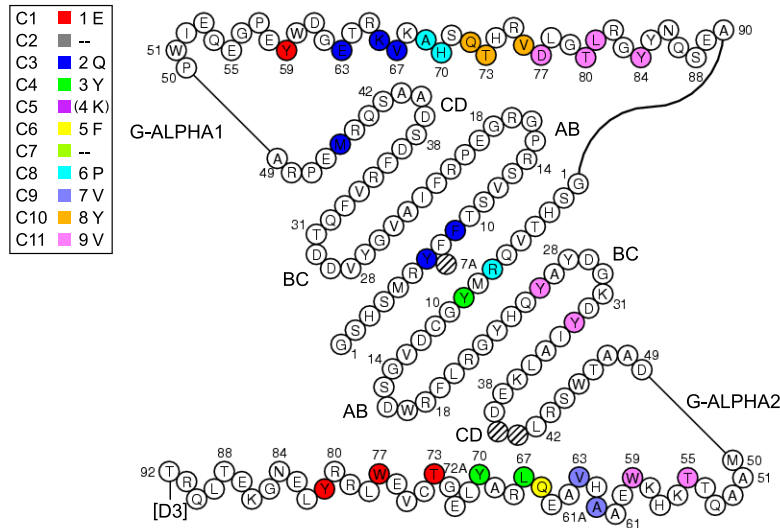
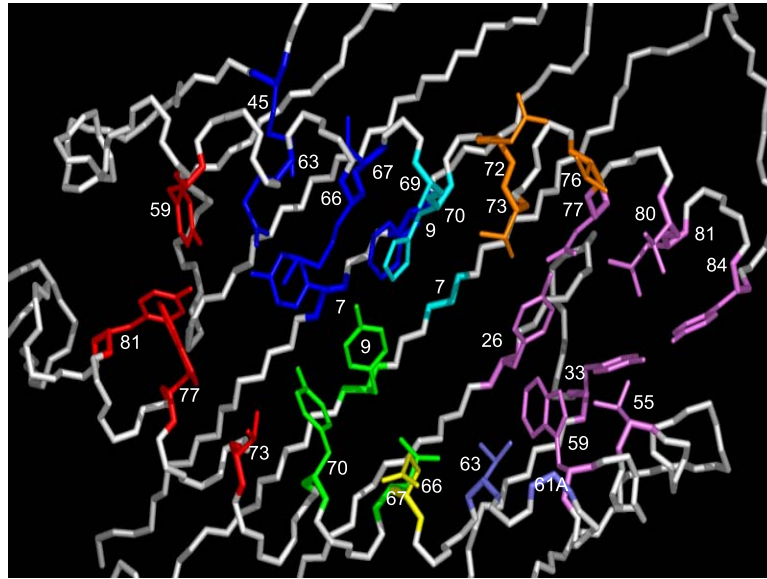
IMGT Collier de Perles pMHC contact sites

Human HLA-A*0201 (MHC-I) and a 9-amino acid peptide



Kaas and Lefranc, In Silico Biology 5, 505-528 (2005)

IMGT Collier de Perles pMHC contact sites



Contacts between MHC-I and the peptide side chains for a 9-amino acid peptide. Views from above the cleft with G-A1 on top and G-A2 on bottom. In the box, C1 to C11 refer to contact sites in MHC-I 3D structures with 9-amino acid peptides. There is no C5 in this 3D structure as P4 does not contact MHC amino acids (46 is shown between parentheses in the box).

Kaas and Lefranc, In Silico Biology 5, 505-528 (2005)