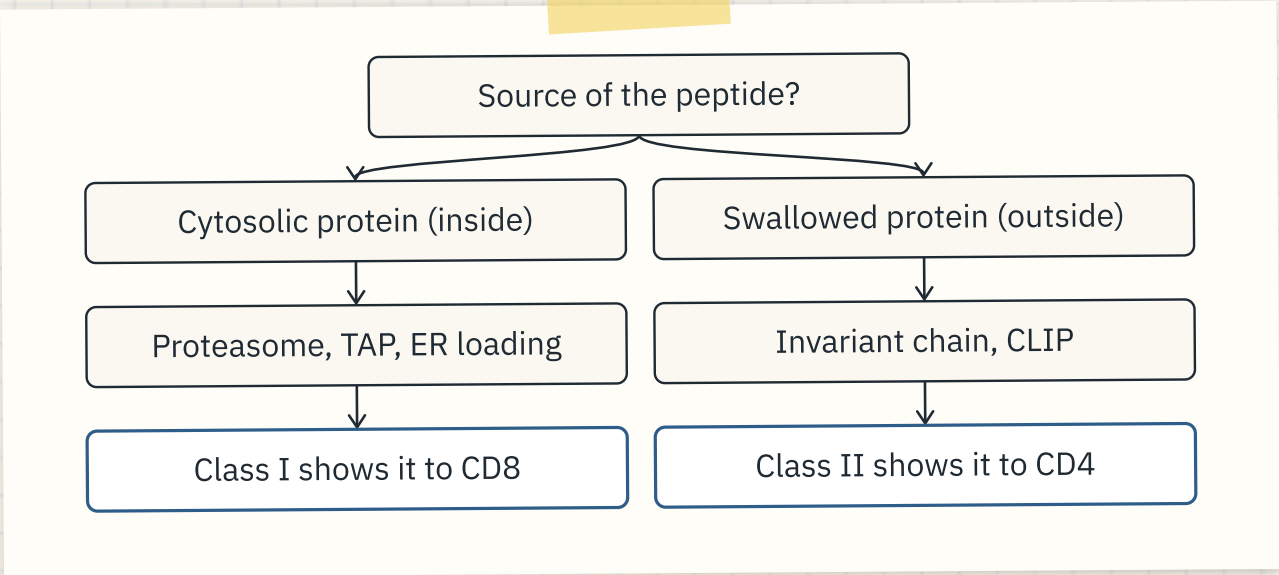
MHC I vs MHC II

Inside route, outside route, and the T cell that reads each



Step by step

1. Ask where the peptide came from: inside the cell, or swallowed from outside.
2. Inside peptides pass through the proteasome and TAP onto MHC class I.
3. Outside peptides load onto class II after the invariant chain, CLIP and HLA-DM.
4. Class I is read by CD8 T cells; class II by CD4 T cells.

	Class I	Class II
Sits on	All nucleated cells	Mainly antigen-presenting cells
Chains	Alpha + beta-2 microglobulin	Alpha + beta
Peptide from	Inside the cell	Swallowed from outside
Machinery	Proteasome, TAP	Invariant chain, CLIP, HLA-DM
Co-receptor	CD8 on alpha-3	CD4 on beta-2

Class I versus class II

Memory trick

CD8 × MHC I = 8

CD4 × MHC II = 8

Exam traps

- Dendritic cells can load swallowed antigen onto class I: cross-presentation.
- Match the class to where the peptide came from, not to the cell: a dendritic cell carries both classes.
- A conventional T cell reads a short peptide in the groove, never a whole protein.

MHC I vs MHC II: how antigen presentation works

Video, written lesson, practice question and sources: medservatory.com/usmle-step-1/immunology/mhc-class-1-vs-class-2-antigen-presentation

For exam study only, not medical advice. Follow local guidelines and your lab's ranges.
© 2026 Medservatory, a project of ADMR Solutions Ltd. Free to print and share for personal study.