



NHS Blood & Transplant

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**Antigen** HLA-B\*07:02 MHC class I

**Clone** P-25

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**Immunoglobulin Class** Mouse IgG1 kappa light chain

## Antigen Description and Distribution

The major histocompatibility complex (MHC) is the most polygenic and polymorphic region in the human genome. Human leukocyte antigens (HLA) Class I include HLA-A, -B and -C loci. The HLA genes constitute a large subset of the MHC of humans. HLA-B is a component of certain MHC class I cell surface receptor glycoproteins that resides on the surface of all nucleated cells and platelets. Class I MHC molecules bind peptides generated mainly from degradation of cytosolic proteins by the proteasome and display intracellular proteins to cytotoxic T cells. However, class I MHC can also present peptides generated from exogenous proteins, in a process known as cross-presentation. Alternatively, class I MHC itself can serve as an inhibitory ligand for natural killer cells (NKs). Reduction in the normal levels of surface class I MHC, a mechanism employed by some viruses during immune evasion or in certain tumors, will activate NK cell killing. MHC class I molecules consist of two polypeptide chains,  $\alpha$  and  $\beta$ 2-microglobulin ( $\beta$ 2m). The two chains are linked noncovalently via interaction of  $\beta$ 2m and the  $\alpha$ 3 domain. Only the  $\alpha$  chain is polymorphic and encoded by a HLA gene, while the  $\beta$ 2m subunit is not polymorphic and encoded by the Beta-2 microglobulin gene. The  $\alpha$ 3 domain is plasma membrane-spanning and interacts with the CD8 co-receptor of T-cells. The  $\alpha$ 1 and  $\alpha$ 2 domains fold to make up a groove for peptides to bind. MHC class I molecules bind peptides that are 8-10 amino acid in length. Hundreds of alleles of HLA-B are known, each of which is given a particular number (such as HLA-B7 serotype). Closely related alleles are categorized together. The serotype identifies the more common HLA-B\*07 gene products.<sup>[1]</sup> Subtypes are designated as HLA-B\*07:02 for example. The HLA-B gene is located on the short (p) arm of chromosome 6 at position 21.3. B7 is found in two major haplotypes in Europe, where it reaches peak frequency in Ireland.

## Clone

P-25 is produced from a mouse hybridoma derived from fusion of Balb/c spleen cells with X63Ag8.653 myeloma cells. P-25 was made in response to immunisation with Glanzmann's platelets (lacking glycoprotein IIb/IIIa).

## References

1. Marsh SG, Albert ED, Bodmer WF, *et al.* (2005). "Nomenclature for factors of the HLA system, 2004". *Tissue Antigens* **65** (4): 301–69.