The human immune system encounters millions of diverse antigens and antigenic epitopes. The ability of lymphocytes to respond specifically to these stimuli is ensured by the immense diversity of antigen-specific receptors—immunoglobulins (Ig) on B lymphocytes and T-cell receptors (TCRs) on T lymphocytes. If the entire repertoire of these receptors were encoded by separate genes, it would occupy the majority of the genome. Instead, evolution has produced a system that, through the recombination of a limited number of gene segments, can generate unique combinations for each lymphocyte or lymphocyte clone.

Both membrane-bound and secreted immunoglobulins of B lymphocytes are composed of two heavy (IgH) and two light (IgL) chains, linked by disulfide bonds. The genes encoding the IgH chains are located in a gene complex on chromosome 14q32.3, covering approximately 1250 kilobases. Depending on the haplotype, this complex contains at its 5' end a group of 46–52 functionally and sequentially similar V ("variable") segments, divided into 6–7 families based on sequence homology. These are followed by a group of 27 D ("diversity") segments and a group of 6 J ("joining") segments. At the 3' end are the constant (C) gene segments of the heavy chain, whose usage defines the individual classes of immunoglobulins.