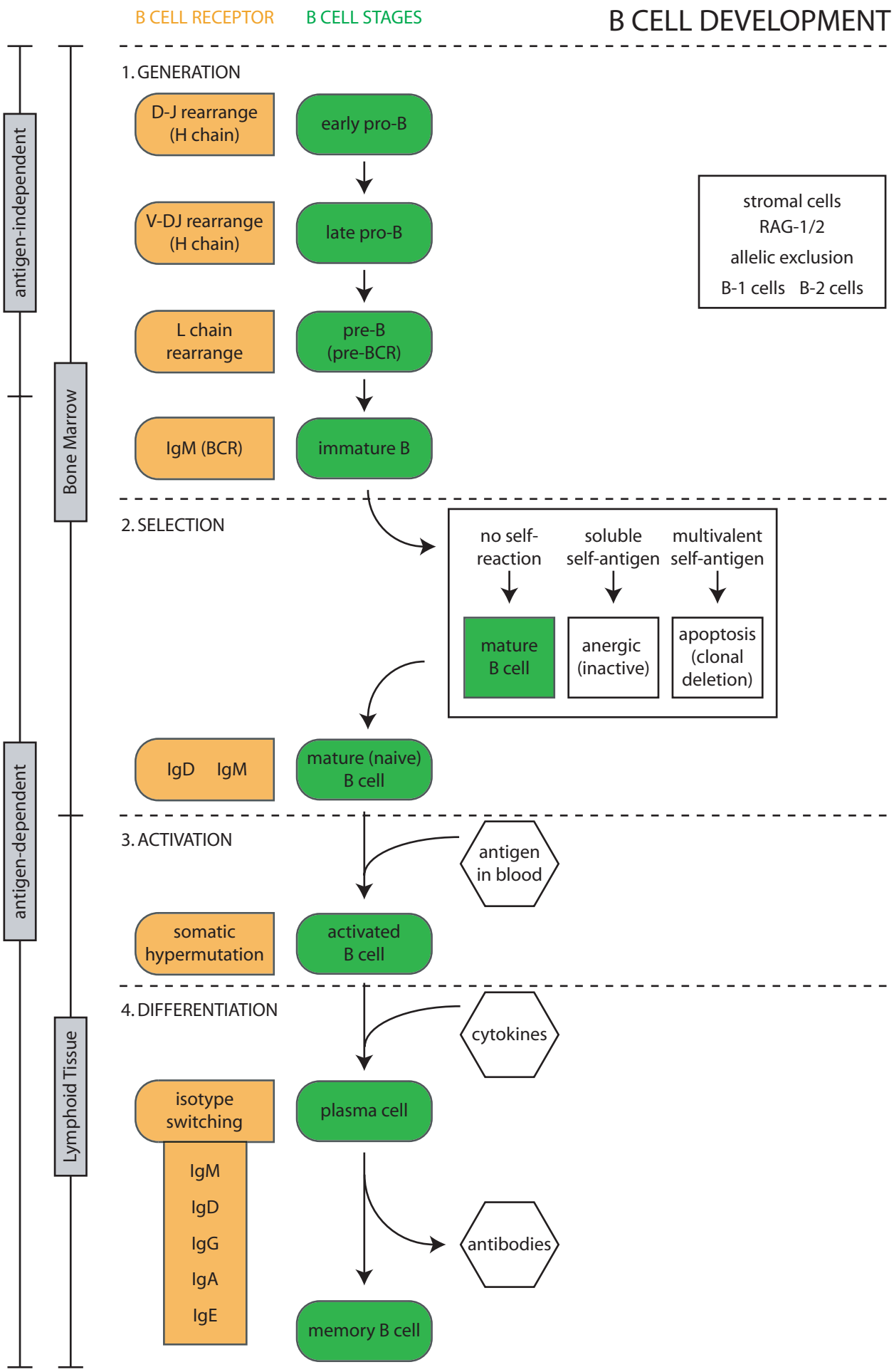
B CELL RECEPTOR
B CELL STAGES
B CELL DEVELOPMENT
antigen-independent
antigen-dependent
Bone Marrow
Lymphoid Tissue
1. GENERATION
D-J rearrange (H chain)
early pro-B
V-DJ rearrange (H chain)
late pro-B
L chain rearrange
pre-B (pre-BCR)
IgM (BCR)
immature B
stromal cells
RAG-1/2
allelic exclusion
B-1 cells B-2 cells
2. SELECTION
no self-reaction
soluble self-antigen
multivalent self-antigen
mature B cell
anergic (inactive)
apoptosis (clonal deletion)
IgD IgM
mature (naive) B cell
3. ACTIVATION
antigen in blood
somatic hypermutation
activated B cell
4. DIFFERENTIATION
cytokines
isotype switching
IgM
IgD
IgG
IgA
IgE
plasma cell
antibodies
memory B cell