

Clusters of differentiation

Monocytes

- Monocytes are an evolutionarily conserved subset of white blood cells that originate from myeloid progenitors in the bone marrow. They represent 4% of the white blood cells in mice, and 10% in humans (van Furth R and Sluiter W 1986), with a considerable number of monocytes in the spleen and lungs that can mobilize to other tissues (Swirski FK et al. 2009). Monocytes are rapidly recruited to tissues during infection and inflammation, where they differentiate into macrophages or dendritic cells (DC)(Karlmark KR et al. 2012, Nathan CF 2008).

They also play a key role in the maintenance of homeostasis. However, while monocytes are necessary for eliminating invading bacteria, virus, fungi and protozoans, they can also have negative effects on the pathogenesis of inflammatory and degenerative diseases. Accordingly, they are considered key therapeutic targets for disease treatment.

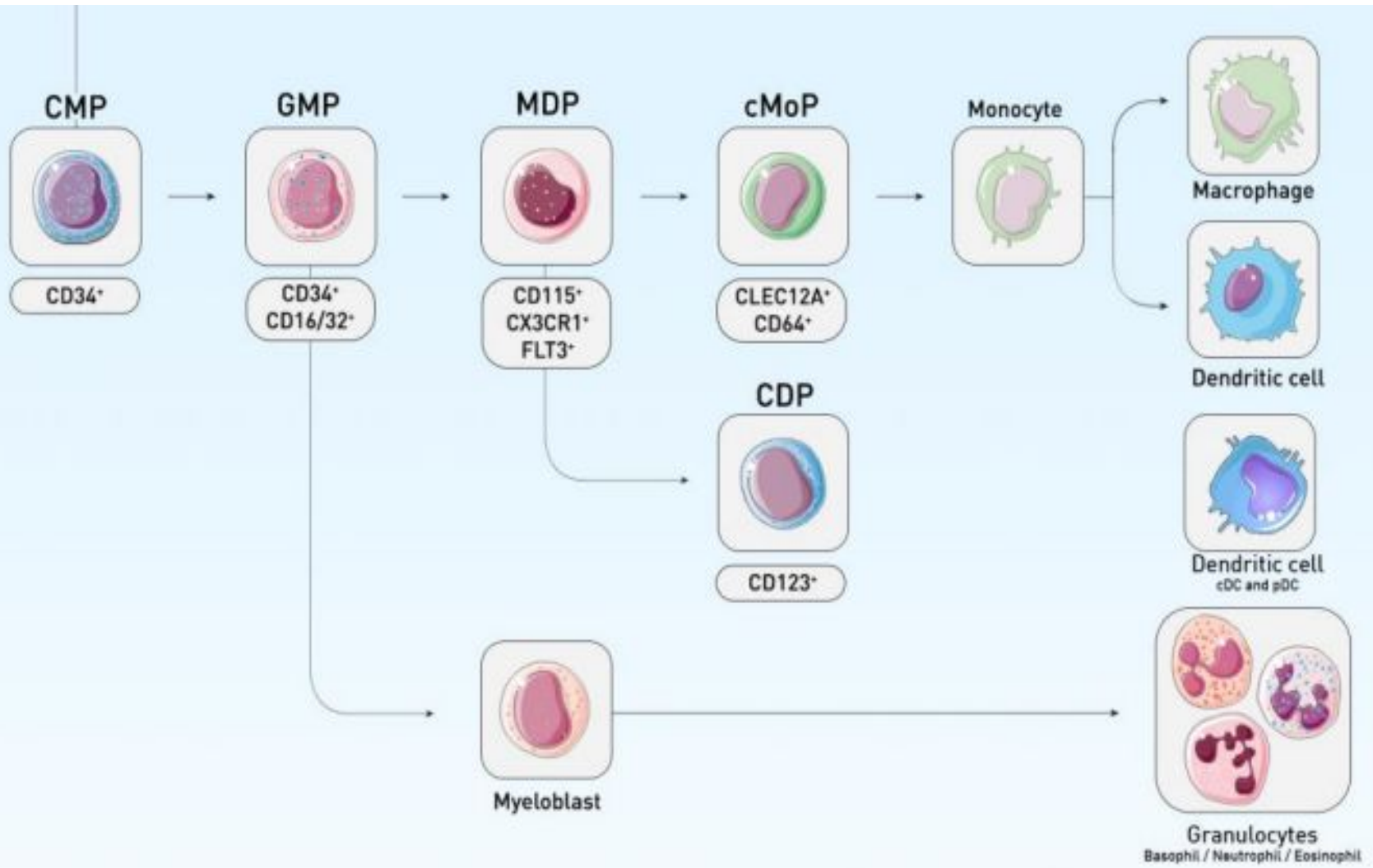


Figure 1. Différentes étapes de l'hématopoïèse permettant la production de monocytes.
 (Kawamura et al., 2017; Lee et al., 2015).

Monocyte lineage

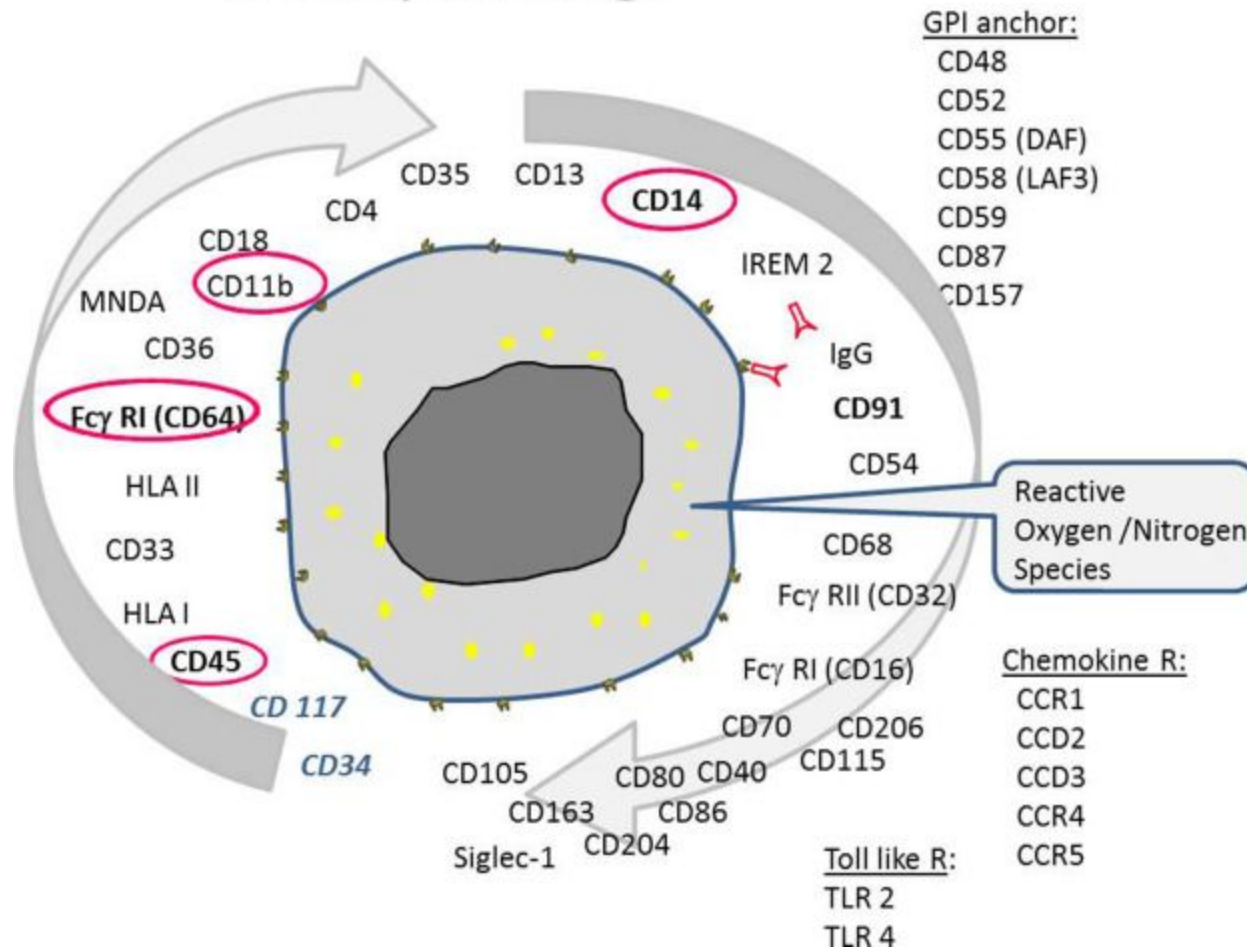


Figure 2 : List of markers of interest for identification of monocyte

Tableau 1: Main monocyte populations

	Markers
HUMAN	
Classical: 90-95% of circulating monocytes	CD14 ^{hi} CD16 ⁻ CD64 ⁺ CD62L ⁺ TNFR1 ⁺ TNFR2 ^{low}
Intermediate: Minor subpopulation of CD16 ⁺ subset	CD14 ^{hi} CD16 ⁺ CD64 ⁺ HLA-DR ^{hi} TNFR1 ^{hi} TNFR2 ⁺
Non-classical: 5-10%	CD14 ^{low} CD16 ^{hi} CD64 ⁻ TNFR1 ^{low} TNFR ^{hi}

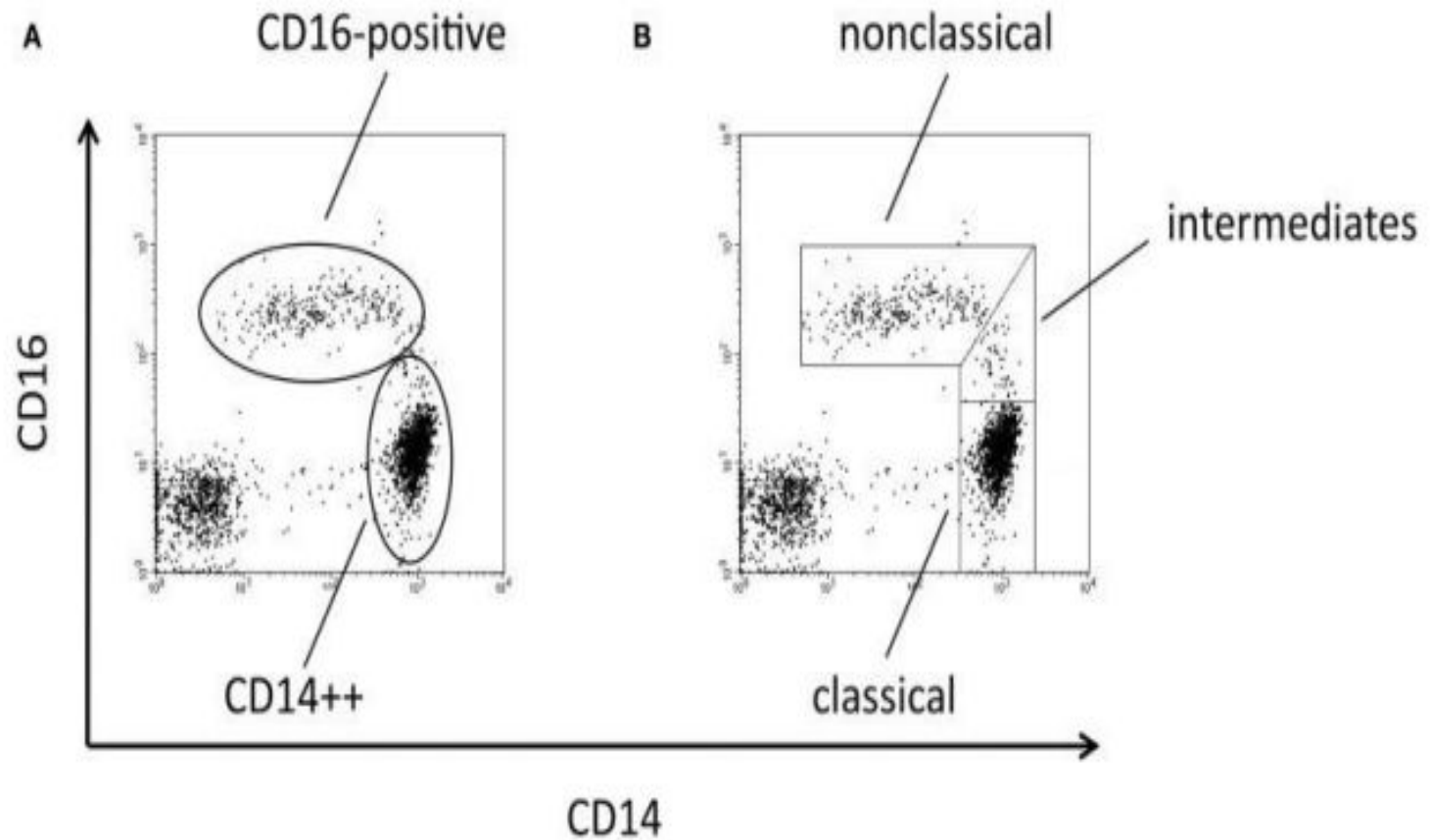


Figure 3. Sous-populations monocytaires en fonction de l'expression du CD14 et du CD16 (Ziegler-Heitbrock and Hofer, 2013).

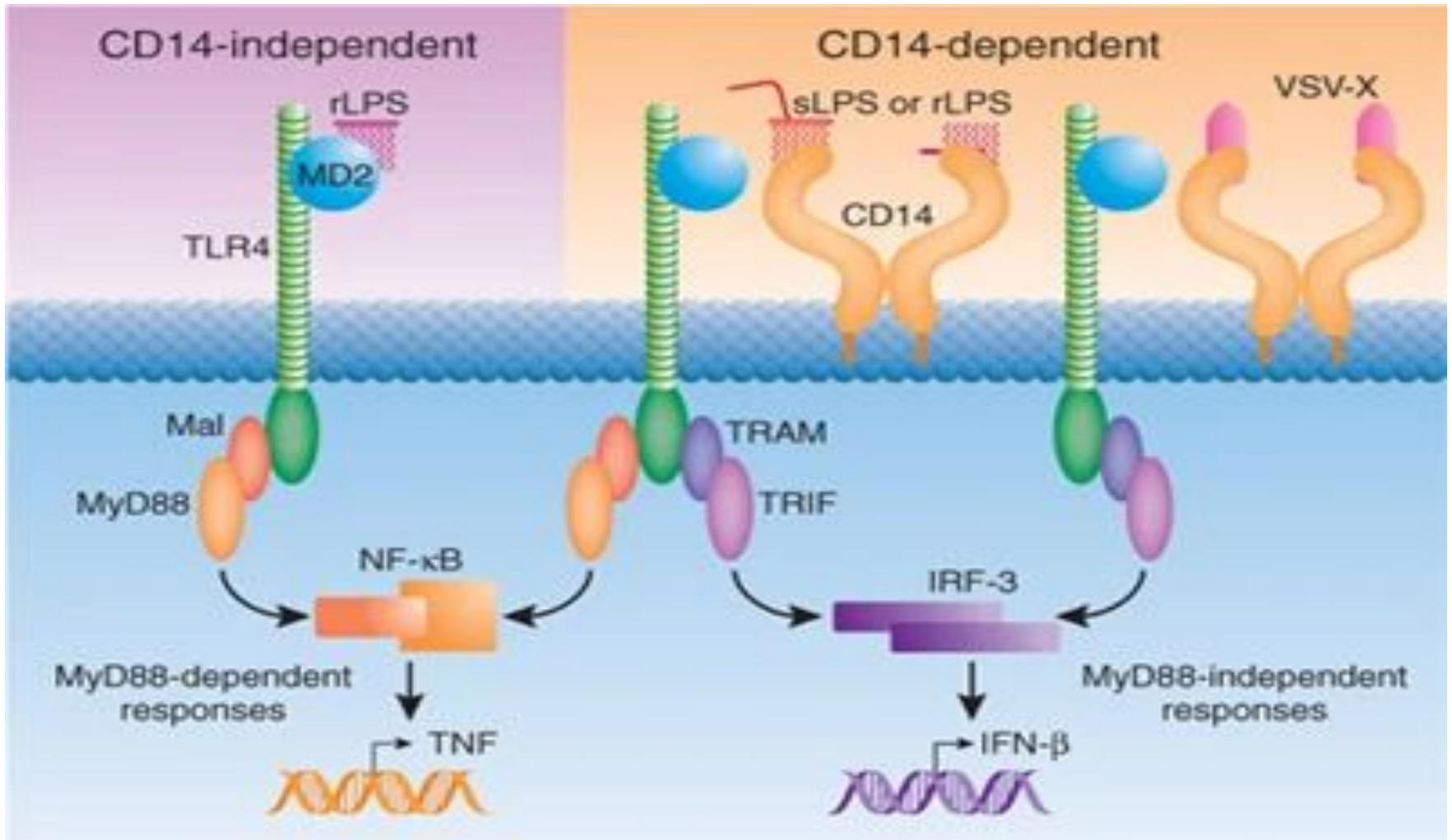


Figure 4. CD14-independent and CD14-dependent signaling by TLR4-MD2. (Godowski PJ., 2005, Nat Immunol).

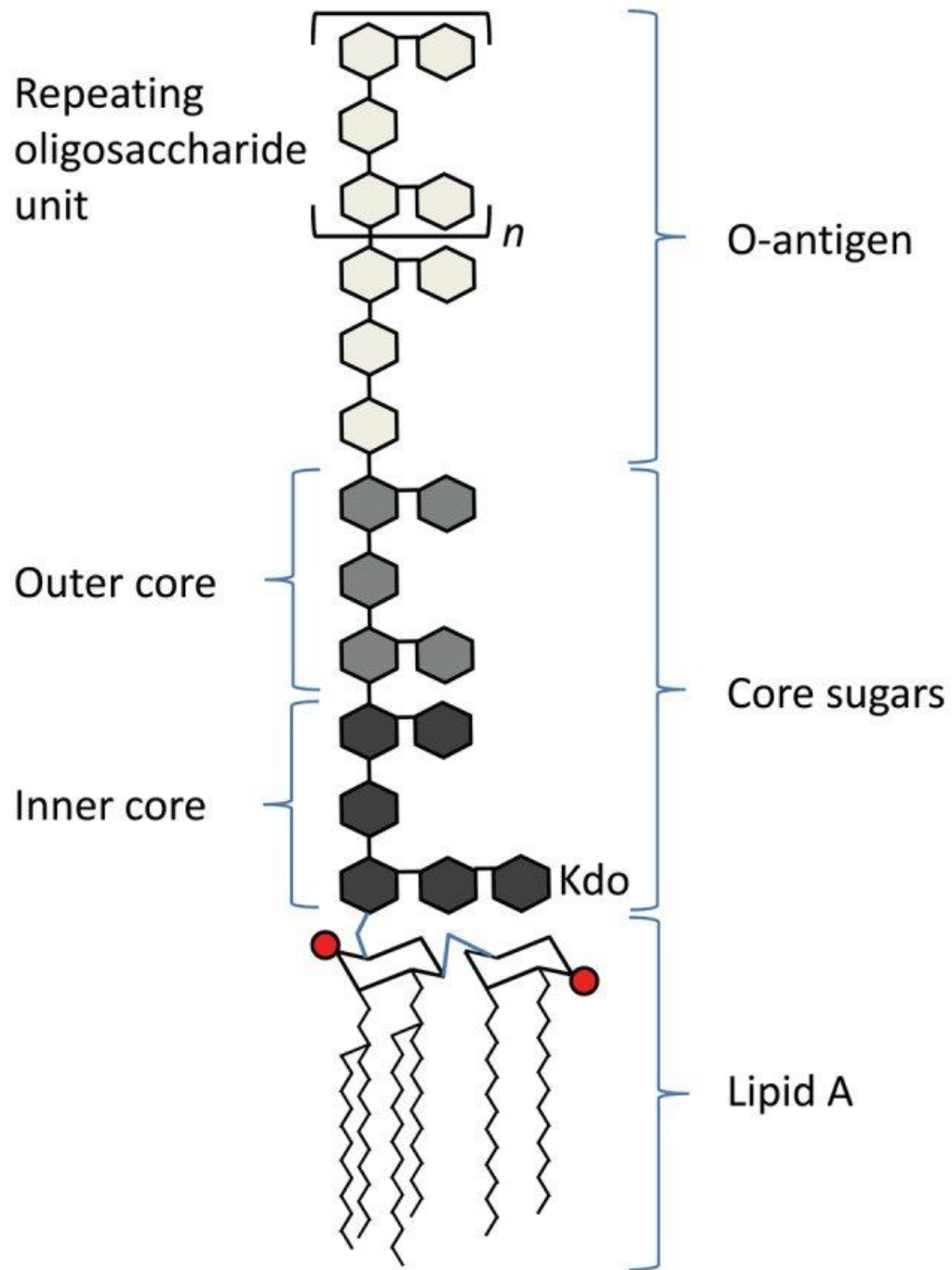


Figure 5: the basic structure of lipopolysaccharide (Nina Maeshima and Rachel C Fernandez., 2013)