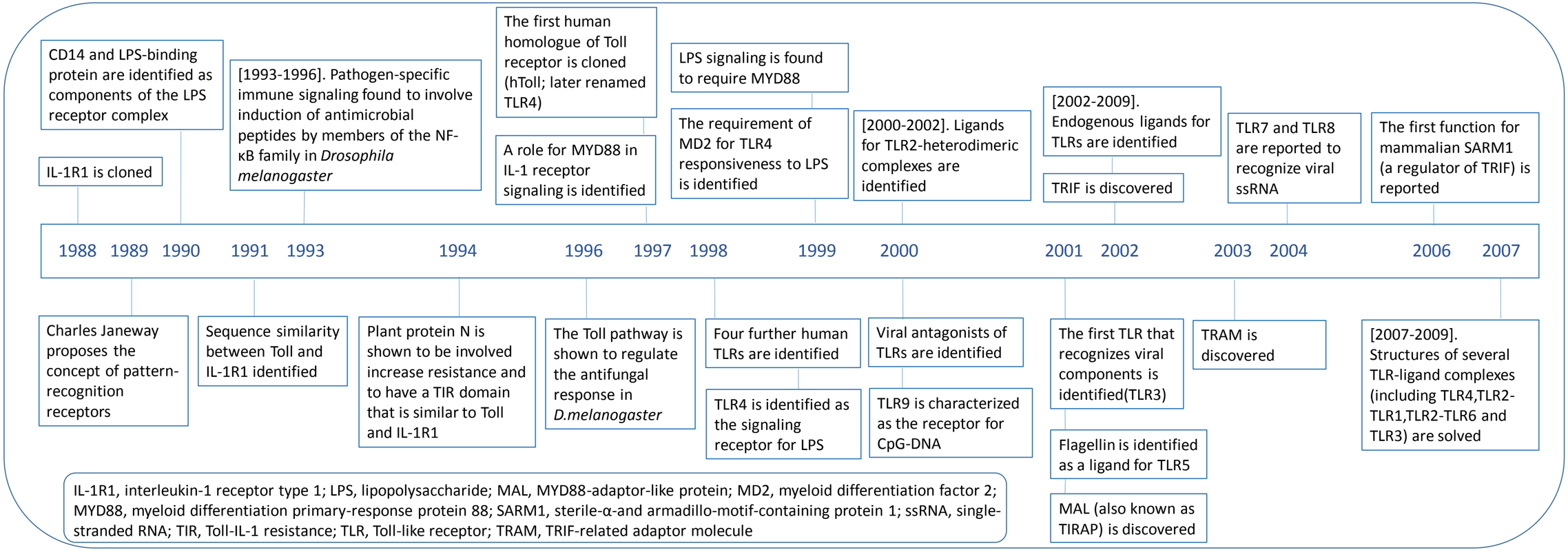
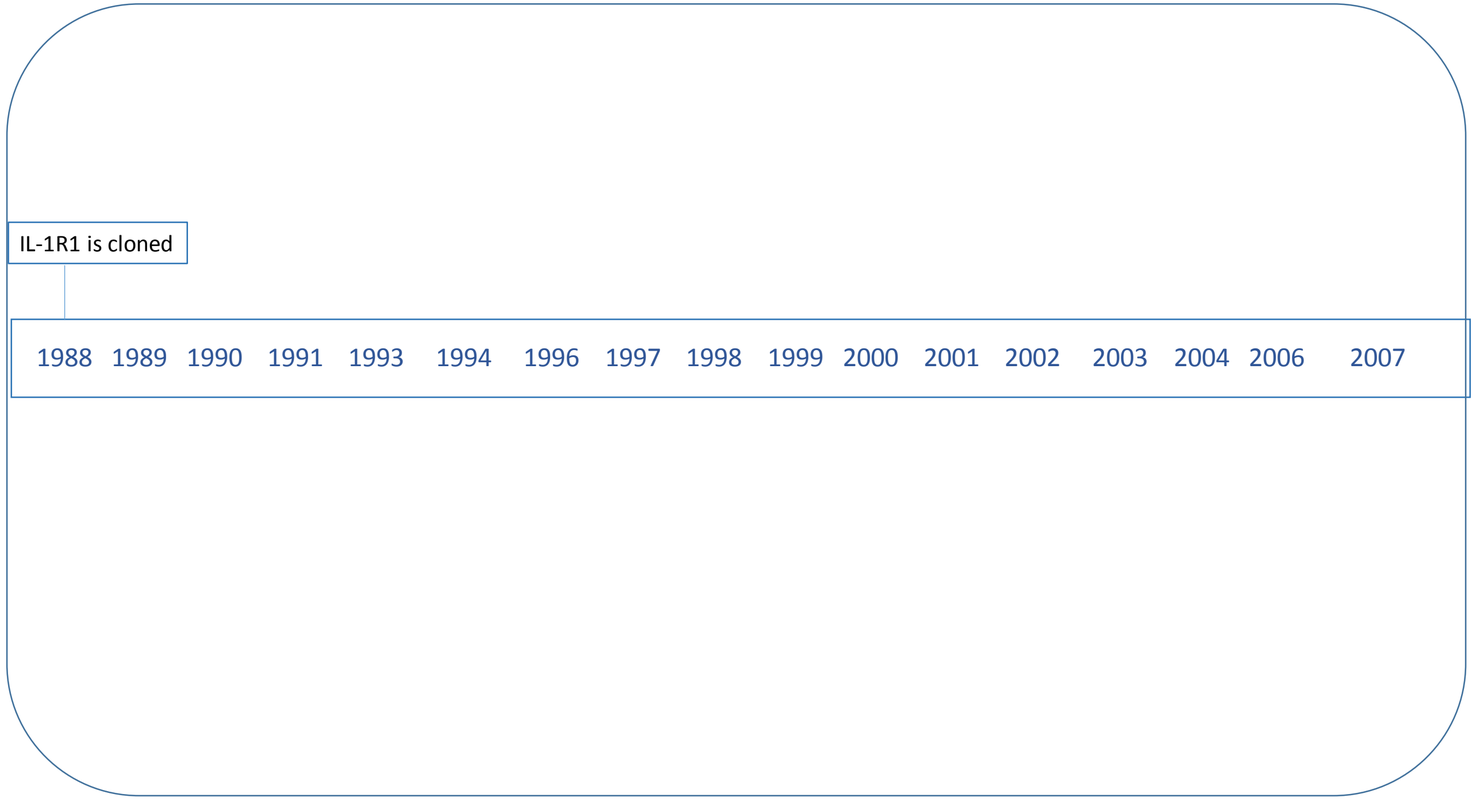

CD14 and LPS-binding protein are identified as components of the LPS receptor complex
IL-1R1 is cloned
[1993-1996]. Pathogen-specific immune signaling found to involve induction of antimicrobial peptides by members of the NF-κB family in *Drosophila melanogaster*
The first human homologue of Toll receptor is cloned (hToll; later renamed TLR4)
A role for MYD88 in IL-1 receptor signaling is identified
LPS signaling is found to require MYD88
The requirement of MD2 for TLR4 responsiveness to LPS is identified
[2000-2002]. Ligands for TLR2-heterodimeric complexes are identified
[2002-2009]. Endogenous ligands for TLRs are identified
TRIF is discovered
TLR7 and TLR8 are reported to recognize viral ssRNA
The first function for mammalian SARM1 (a regulator of TRIF) is reported
1988 1989 1990 1991 1993 1994 1996 1997 1998 1999 2000 2001 2002 2003 2004 2006 2007
Charles Janeway proposes the concept of pattern-recognition receptors
Sequence similarity between Toll and IL-1R1 identified
Plant protein N is shown to be involved increase resistance and to have a TIR domain that is similar to Toll and IL-1R1
The Toll pathway is shown to regulate the antifungal response in *D.melanogaster*
Four further human TLRs are identified
TLR4 is identified as the signaling receptor for LPS
Viral antagonists of TLRs are identified
TLR9 is characterized as the receptor for CpG-DNA
The first TLR that recognizes viral components is identified(TLR3)
Flagellin is identified as a ligand for TLR5
MAL (also known as TIRAP) is discovered
TRAM is discovered
[2007-2009]. Structures of several TLR-ligand complexes (including TLR4,TLR2-TLR1,TLR2-TLR6 and TLR3) are solved
IL-1R1, interleukin-1 receptor type 1; LPS, lipopolysaccharide; MAL, MYD88-adaptor-like protein; MD2, myeloid differentiation factor 2; MYD88, myeloid differentiation primary-response protein 88; SARM1, sterile-α-and armadillo-motif-containing protein 1; ssRNA, single-stranded RNA; TIR, Toll-IL-1 resistance; TLR, Toll-like receptor; TRAM, TRIF-related adaptor molecule


IL-1R1 is cloned
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