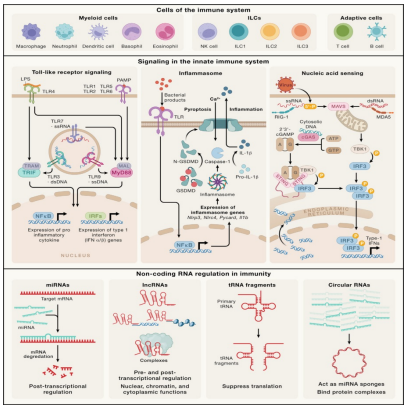

From Periphery to Center Stage: 50 Years of Advancements in Innate Immunity

Description

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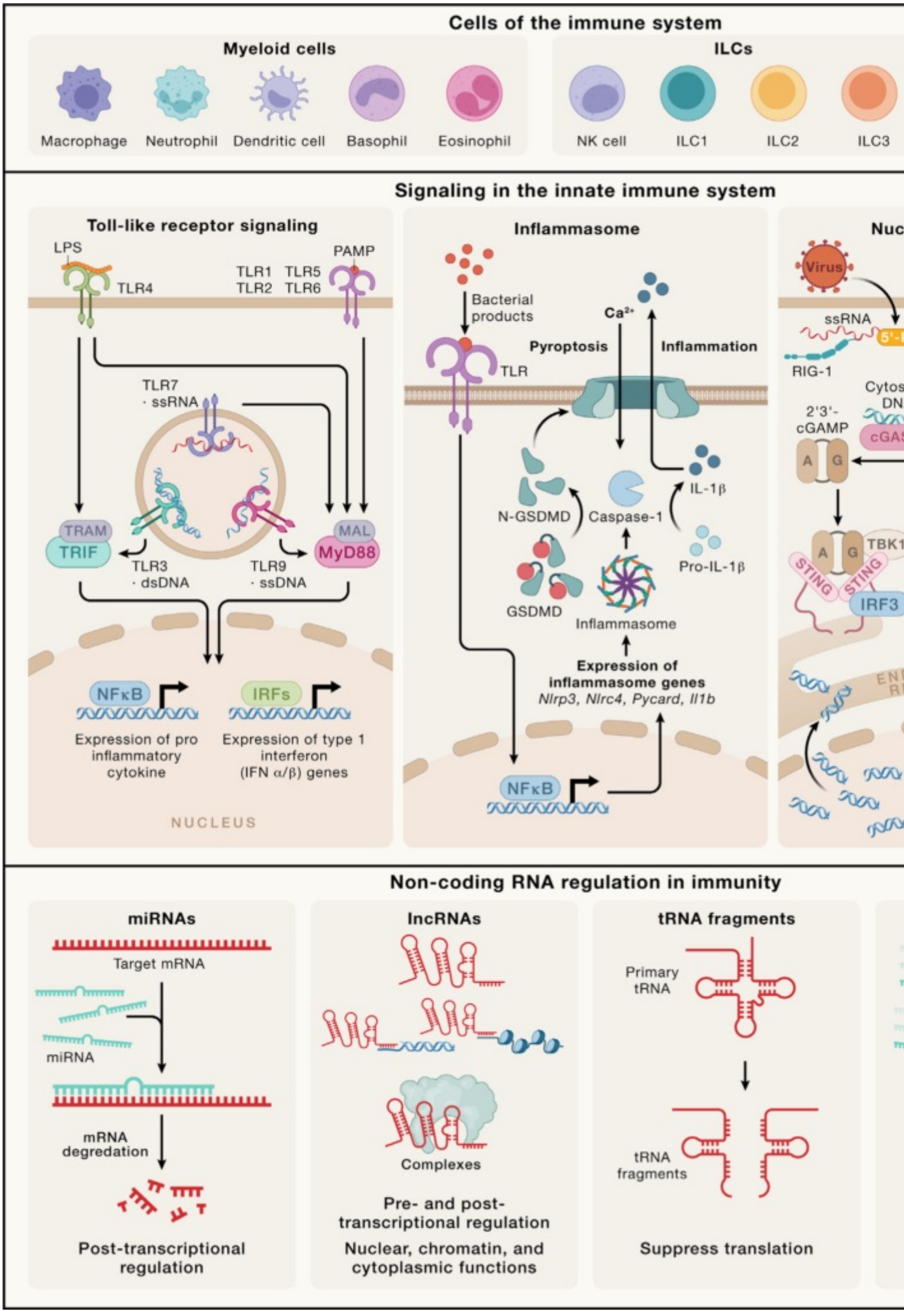
Over the past 50 years in the field of immunology, something of a Copernican revolution has happened. For a long time, immunologists were mainly concerned with what is termed adaptive immunity, which involves the exquisitely specific activities of lymphocytes. But the other arm of immunity, so-called â??â??innate immunity,â??â?? had been neglected. To celebrate Cellâ??s 50th anniversary, we have put together a review of the processes and components of innate immunity and trace the seminal contributions leading to the modern state of this field. Innate immunity has joined adaptive immunity in the center of interest for all those who study the bodyâ??s defenses, as well as homeostasis and pathology. We are now entering the era where therapeutic targeting of innate immune receptors and downstream signals hold substantial promise for infectious and inflammatory diseases and cancer.


Cells of the immune system
Myeloid cells
Macrophage
Neutrophil
Dendritic cell
Basophil
Eosinophil
ILCs
NK cell
ILC1
ILC2
ILC3
Signaling in the innate immune system
Toll-like receptor signaling
LPS
TLR4
PAMP
TLR1 TLR5
TLR2 TLR6
TLR7
· ssRNA
TRAM
TRIF
MAL
MyD88
TLR3
· dsDNA
TLR9
· ssDNA
NFκB
Expression of pro inflammatory cytokine
IRFs
Expression of type 1 interferon (IFN α/β) genes
NUCLEUS
Inflammasome
Bacterial products
TLR
Pyroptosis
Ca2+
Inflammation
N-GSDMD
Caspase-1
IL-1β
Pro-IL-1β
GSDMD
Inflammasome
Expression of inflammasome genes
Nlrp3, Nlrc4, Pycard, Il1b
NFκB
Nuc
Virus
ssRNA
RIG-1
2'3'-cGAMP
A
G
TBK1
STING
IRF3
Non-coding RNA regulation in immunity
miRNAs
Target mRNA
miRNA
mRNA degredation
Post-transcriptional regulation
lncRNAs
Complexes
Pre- and post-transcriptional regulation
Nuclear, chromatin, and cytoplasmic functions
tRNA fragments
Primary tRNA
tRNA fragments
Suppress translation

Category

1. News