Innate immune biology offers a multitude of clinical targets and pathways across several therapeutic areas.

IFM Therapeutics is investigating systemic and targeted delivery options, as well as the potential for combination treatments.

### UNDERSTANDING INNATE IMMUNITY

#### INFLAMMASOMES

IFN-β is the first cytokine to be released, acting on dendritic cells (DCs), which develop into mature DCs.

- **Surfing DCs** present the pathogen to the immune system, activating the innate immune system.
- **NOD-like receptors (NLRs)** recruit help to overcome threats, using inflammatory responses.
- **PRRs**, like NLRs, recruit help to overcome threats, using inflammatory responses.
- **Cell death** can attract other inflammatory mediators to fight infection.

#### IMMUNE SYSTEM AND DISEASE

If the immune system consistently under-responds or over-responds, serious diseases can result.

- **Pathogens** are identified by **Pattern Recognition Receptors (PRRs)** found on the surface or inside specialized immune cells.
  - **NOD-like receptors (NLRs)** identify internal threats by damage-associated molecular patterns (DAMPs).
  - **C-type lectin receptors (CLR)** identify external threats by pathogen-associated molecular patterns (PAMPs).

#### DEEP DIVE INTO INNATE IMMUNITY

A variety of innate immune cell types build the first line of defense, surveilling for threats and quickly responding to invading pathogens.

- **Dendritic cells** help to present antigens to T cells.
- **B cells** create antibodies against the pathogen.
- **Macrophages** engulf and destroy invading pathogens.

Innate immunity is the body’s first line of defense and responds quickly to anything that shouldn’t be there.

The adaptive immune system develops memory of pathogen exposures, which T and B cells can use to respond more quickly to subsequent infections.

Cancers grow and spread when tumor cells evade detection by the immune system. The innate immune system is responsible for detecting cancer cells and signaling to the adaptive immune system for the destruction of the cancer cells.

Certain diseases trigger the innate immune system to unnecessarily respond and cause excessive inflammation. This type of chronic inflammation is associated with autoimmune and auto-inflammatory conditions.

### IMMUNE SYSTEM AND DISEASE

- **Cancers** grow and spread when tumor cells evade detection by the immune system. The innate immune system is responsible for detecting cancer cells and signaling to the adaptive immune system for the destruction of the cancer cells.
- **Cancers** can also be eliminated by the adaptive immune system.

Scientists estimate innate immunity comprises approximately 80% of the immune system.

#### PATTER RECOGNITION RECEPTORS

- **Surface PRRs**: TLRs, C-type lectin receptors (CLRs), and Pattern Recognition Receptors (PRRs) associated with microbial pathogen recognition (MAPR)
- **Internal PRRs**: NOD-like receptors (NLRs), RIG-1-like receptors (RLRs)

#### INFLAMMATION

- **Antibodies** label pathogens for destruction.
- **Macrophages** engulf and destroy invading pathogens.

#### INFECTIOUS DISEASES

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