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EDITORIAL

Therapeutic approaches for genetic and infectious diseases

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Extrinsic and intrinsic factors perturb the normal structure, function, or structural—functional coordination of the host that results in disease, either infectious or non-infectious. Infectious diseases are caused by bacteria, viruses, fungi and parasites, and the host defense system provides protection against them. Noninfectious diseases, such as cancers and autoimmune or congenital/genetic diseases, are associated with development and primarily managed by surgical intervention or through symptom management. This issue of *International Reviews of Immunology* focuses on a few cytokines playing a pivotal role in infectious disease, and the possibilities for development of a pan-vaccine for subtypes of influenza virus. The issue also discusses a recently discovered genetic tool in the correction of mutation occurring in genetic diseases (Figure 1).

Cytokines are either native or post-translationally modified proteins, synthesized and secreted by immune cells for communication among immune cells. Cytokines maintain growth, differentiation, and maintenance of immune responses and immune homeostasis. The synthesis and production of several cytokines, particularly Interleukin (IL)—1 family cytokines, are tightly regulated and synthesize in zymogen (inactive) form. The production of secretory bioactive cytokines depends on stimuli, which in turn activate a multiprotein complex known as inflammasome. The first review article of this issue by Allam et al. discusses the immunosuppressive role of

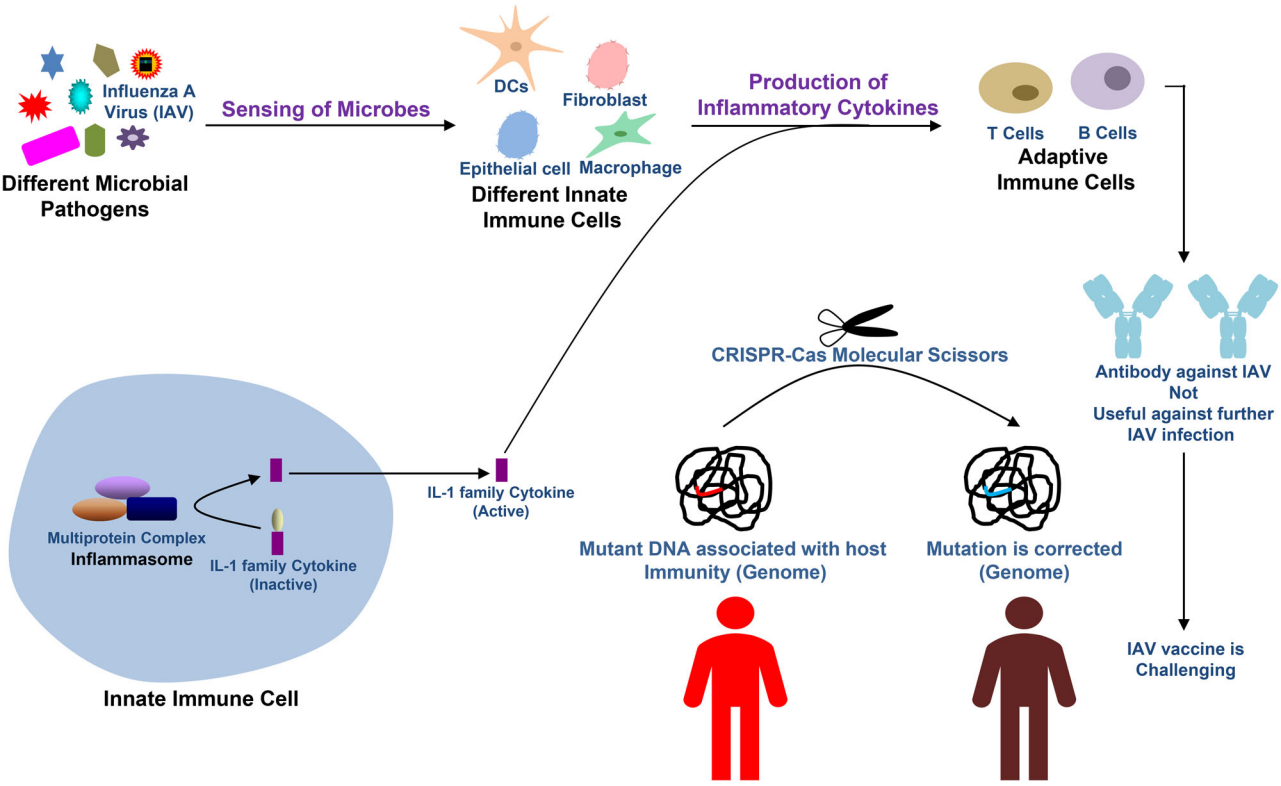

Figure 1. Therapeutic approaches for genetic and infectious diseases.

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IL-37, an IL-1 family cytokine, produce during microbial infection [1]. In several infectious diseases, microbes induce the storm of inflammatory cytokines that cause immunopathology and severely affect the vitals and vital organs of the host. The article highlights the clinical relevance of IL-37 in reducing infection-associated inflammation suggesting its therapeutic potential. However, before taking IL-37 to clinics, it requires better understanding of its effect under physiological conditions. This article is useful to basic and translational immunology researchers and investigators of pharmacology to understand the therapeutic potential of IL-37 (Figure 1).

The flu is a condition characterized by coughing, sneezing, runny/stuffy nose, sore throat, and head and body pain with fever. Generally, these symptoms are caused by rhinovirus or some members of coronavirus. Most flu conditions resolve within 10–14 days. However, the flu caused by various subtypes of influenza virus can be extremely fatal, as is evidenced by several outbreaks in the past. The second review of this issue by Biswas et al. focuses on the interaction of influenza virus and host immunity [2]. The article highlights how the influenza virus evades antibody responses by generating mutation in surface antigens, namely hemagglutinin and neuraminidase. The article also discusses the possibilities for the development of vaccine against diverse influenza viruses (Figure 1).

Tremendous progress has been made in gene and genome manipulation. However, correction of mutations in the host is still a major challenge in the treatment of genetic diseases. Recently, the potential of Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) and CRISPR-associated (Cas) proteins made a big leap in the field of genome engineering. The discovery of CRISPR-Cas systems provided hope for the treatment of genetic diseases, but off-targeting by CRISPR-Cas is the biggest challenge to bring it to clinics. The last article of this issue by Juan et al. discusses the discovery of CRISPR-Cas systems and their extrapolation in molecular medicine in the treatment of genetic diseases [3]. This article will be useful to broad readers of immunology, different disciplines of genetic engineering, and industries taking steps for the treatment of genetic diseases (Figure 1).

References

1. The potential role of interleukin-37 in infectious diseases. *Int Rev Immunol* 2020;39(1):3–10. doi:10.1080/08830185.2019.1677644.
2. Current challenges: from the path of "Original antigenic sin" towards the development of universal flu vaccines . *Int Rev Immunol* 2020;39(1):21–36. doi:10.1080/08830185.2019.1685990.
3. CRISPR/Cas: from *adaptive immune system in prokaryotes to therapeutic weapon against immune-related diseases*. *Int Rev Immunol* 2020;39(1):11–20. doi:10.1080/08830185.2019.1677645.