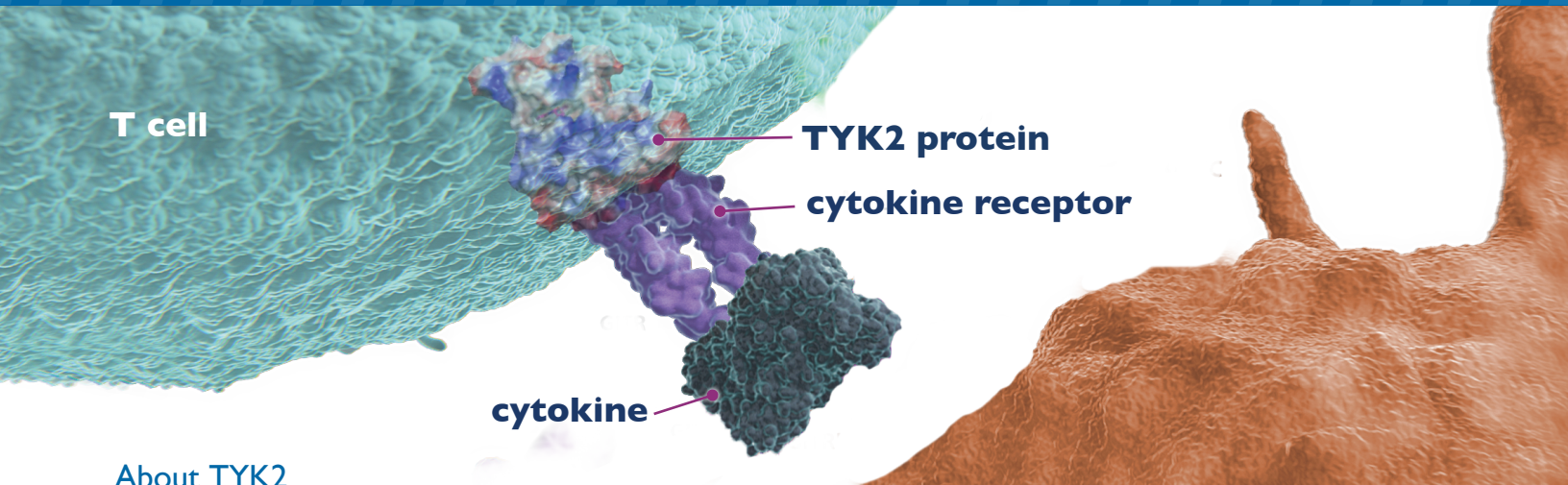


# Tyrosine Kinase 2 (TYK2) Immune Pathway



## About TYK2

Tyrosine kinase 2 (TYK2) is a protein encoded by the TYK gene that mediates immune signaling. TYK2 is important in both innate and adaptive immune cells. In a healthy person, TYK2 is an essential component of maintaining normal immune responses.



### TYK2 and Immune Function

TYK2 activates a series of transcription factors called signal transducer and activator of transcription (STAT).<sup>1</sup>

Activated STATs promote expression of cytokines and cellular processes such as cellular division, differentiation and death.<sup>1</sup>

By binding to specific receptors, cytokines signal through TYK2 to regulate the immune system. These cytokines include IL-12, IL-23 and Type I IFNs.<sup>1,2</sup>



### TYK2 and Disease

Immune cells are correlated with the pathogenesis of autoimmune diseases such as psoriasis, lupus, multiple sclerosis and inflammatory bowel disease.<sup>3</sup>

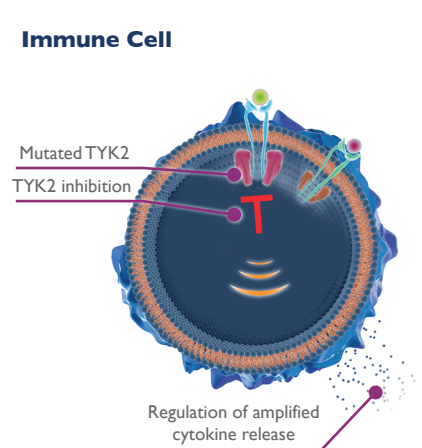
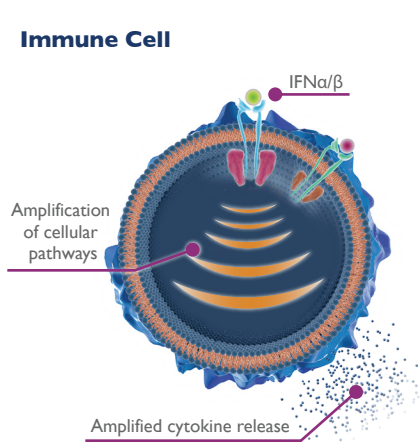
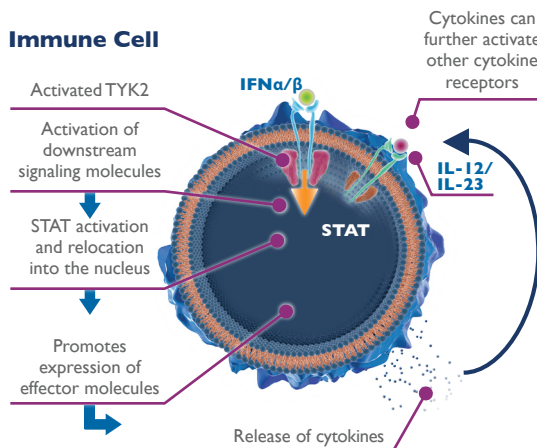
The critical role of TYK2 in driving these pathways is evident in the observation that deactivating mutations in the TYK2 gene provides protection from multiple common autoimmune disorders.<sup>4</sup>



### Research Implications and Interactions

Advancements in the understanding of TYK2 signaling and activation have resulted in the investigation of novel therapeutic interventions.

Through the regulation of overproduction of immune-inflammatory components, it may be possible to suppress difficult-to-treat autoimmune diseases.



The TYK2 pathway is one of many pathways under investigation at Bristol-Myers Squibb.

Learn more about our work in Immunoscience by visiting:

[www.bms.com/researchers-and-partners/areas-of-focus.html](http://www.bms.com/researchers-and-partners/areas-of-focus.html)

<sup>1</sup>Leitner NR, et al. Tyrosine kinase 2 – Surveillant of tumours and bona fide oncogene. *Cytokine*. 2017; 89: 209-218. <sup>2</sup>Paunovic V, et al. Crossed signals: the role of interleukin (IL)-12, -17, -23 and -27 in autoimmunity. *Rheumatology*. 2008; 47:771-776. <sup>3</sup>Li Z, et al. Two Rare Disease-Associated Tyk2 Variants Are Catalytically Impaired but Signaling Competent. *J Immunol*. 2013; 190(5):2335-44. <sup>4</sup>Dendrou et al., Resolving TYK2 locus genotype-to-phenotype differences in autoimmunity. *Sci Transl Med*. 2016; 8:363ra149.



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