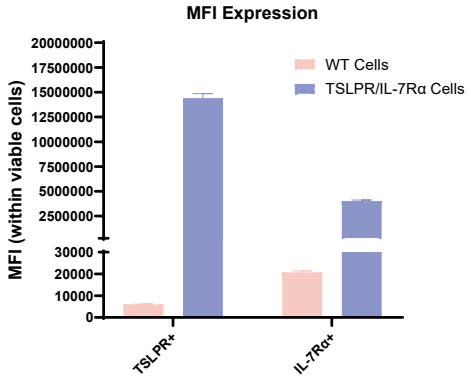
Accelerate allergy therapeutic discovery with human pathway-specific reporter assays

RoukenBio

Our human reporter assay portfolio encompasses epithelial, type 2 inflammatory and IgE-mediated signalling pathways. Engineered cell lines incorporating pathway-responsive luciferase reporters provide robust, quantitative assessment of TSLP, IL-4/IL-13 and FcεRI pathway activation.

To explore how these models could accelerate your allergy therapeutic testing, contact: hello@rouken.bio

TSLPR/IL-7Rα Reporter Cell Line



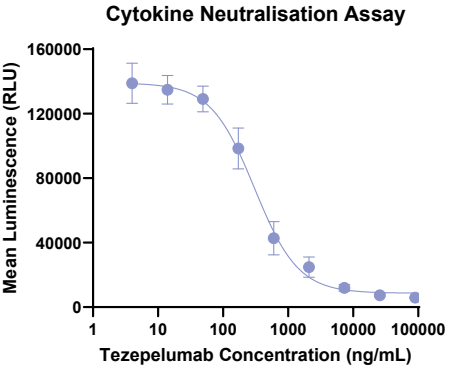


Figure 2: HEK293 cells were engineered to stably express TSLPR and IL-7Rα together with a STAT5- responsive luciferase reporter. Engineered cells showed increased receptor expression relative to WT parental cells. TSLP-induced signalling was quantified by luciferase activity and was inhibited in dose-dependent manner by tezepelumab, consistent with neutralisation of TSLP.

IL-4Rα/IL-13Rα1 Reporter Cell Line

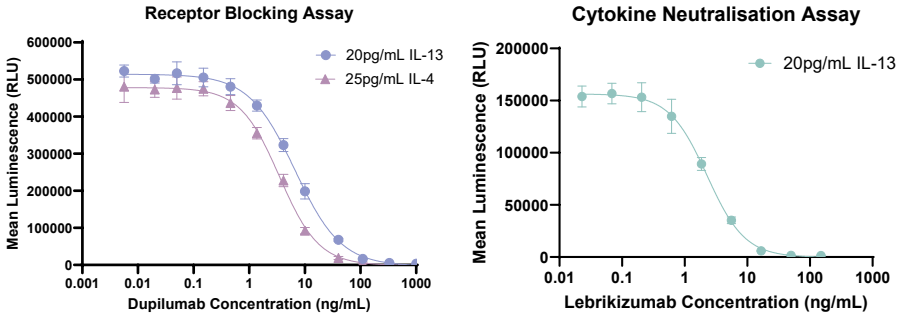


Figure 3: HEK293 cells endogenously expressing IL-4Rα and IL-13Rα1 were engineered to incorporate a STAT6-responsive luciferase reporter. Stimulation with IL-4 or IL-13 induced downstream signalling, leading to STAT6-driven luciferase expression. Signalling was dose-dependently inhibited by dupilumab via receptor blockade, while IL-13 induced signalling was specifically neutralised by lebrikizumab, consistent with pathway-specific cytokine inhibition.

Why Use These Allergy Focused Reporter Platforms?

- ✓ Functional, pathway-relevant readouts
- ✓ Quantitative, dose-responsive performance
- ✓ Robust, consistent engineered cell systems
- ✓ Direct measurement of receptor activation and signalling
- ✓ Rapid, scalable alternative to primary cell assays
- ✓ High-throughput compatible
- ✓ Suitable for efficacy and safety screening

FcεRI Reporter Cell Line

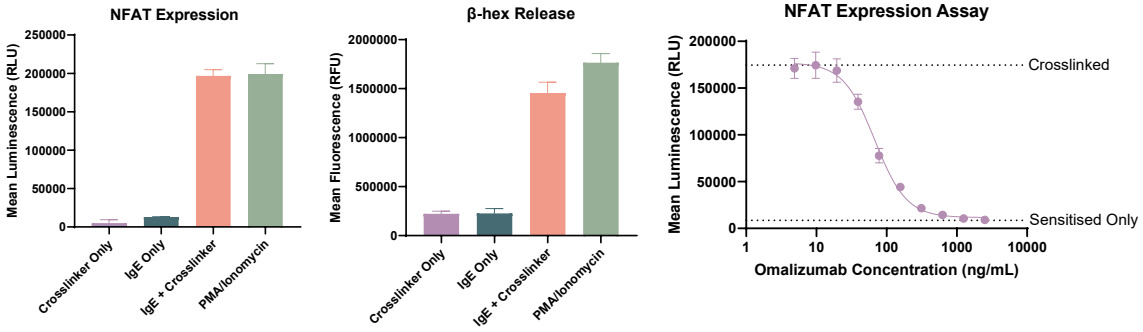


Figure 1: Rat Basophil Leukaemia (RBL-2H3) cells were engineered to express human FcεRI and an NFAT-driven luciferase reporter. IgE pathway activation was assessed using NFAT reporter activity and β-hexosaminidase release, demonstrating concordance between transcriptional signalling and functional degranulation. Omalizumab produced a dose-dependent inhibition of IgE signalling, consistent with blockade of antigen-driven IgE–FcεRI crosslinking.

Key Applications

- ➢ Candidate screening
- ➢ Binding and signalling profiling
- ➢ Functional inhibition testing
- ➢ Quantitative dose response