Biomarker & Bioanalysis Services for Pulmonary Disease

Pulmonary disease research demands a deep understanding of the complex interplay between the immune system and the delicate lung environment, with the respiratory tract being a site for constant interaction between the immune system and foreign proteins. Synexa offers comprehensive solutions to empower your research journey, from intricate biomarker discovery to robust bioanalysis in challenging matrices.

Our Expertise

As your trusted partner, Synexa leverages extensive experience in deciphering the intricate immune landscape of various lung diseases. We specialise in crafting bespoke biomarker strategies to:

- Pinpoint disease mechanisms
- Predict treatment response
- Demonstrate target engagement

We have experience establishing biomarker and bioanalytical assays in complex matrices relevant to lung disease including:

- Bronchoalveolar lavage (BAL)
- Saliva
- Sputum
- Cell lysates

Our Services

Synexa performs bespoke biomarker analysis in multiple matrix types. Our growing network of clinical collaborators gives us access to IRB approved patient samples from multiple pulmonary disease groups including:

- Asthma
- Pulmonary fibrosis
- Chronic obstructive pulmonary disease
- Non-small cell lung cancer
- Infectious lung disease samples including tuberculosis

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Case Studies/Data

SMAD profiling in BAL and cell lysates to understand activation of fibrosis

Synexa validated an assay to quantify total and phospho-SMAD2/3 in cell lysates including those from BAL. The assay involves a key pre-analytical step to generate a standard curve and quality controls for both total and pSMAD2/3. HepG2 and PBMC's are treated with TGF-beta to induce SMAD signaling and phosphorylation. Lysates are prepared with equivalent protein concentrations prior to analysis with two ELISA's, one for total and one for pSMAD2/3.

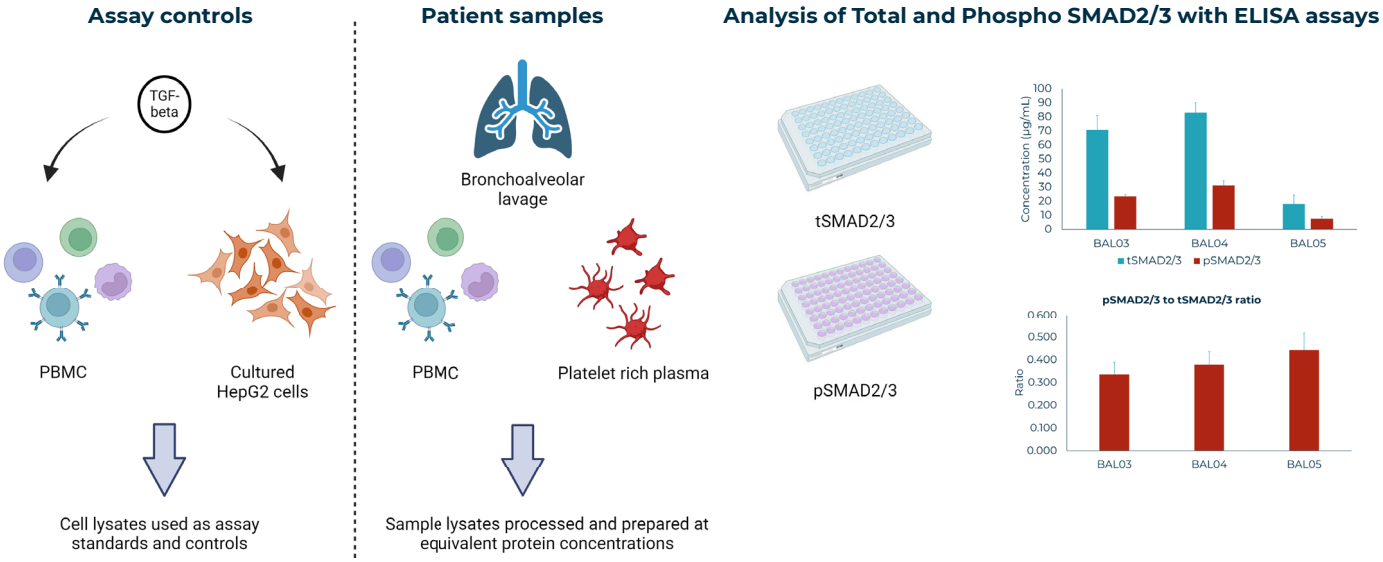

Figure 1. SMAD2/3 analytical workflow and assay variability. Pre-analytical and analytical workflow for standards, controls (HepG2 and PBMC) and samples (BAL). Data from Synexa's assay validation include trending control variability prepared from BAL samples from three individuals. Data represents mean concentrations ± SD of tSMAD2/3, pSMAD2/3 and ratio from four independent experiments with each sample performed in triplicate.

pSTAT6* target engagement via flow cytometry using stabilised whole blood samples

STAT6 is a key inflammatory pathway implicated in multiple inflammatory pulmonary conditions including asthma. Synexa developed a bespoke flow cytometry assay for phosphorylated STAT6 used for clinical analysis and also as a pre-analytical technique to stabilise sensitive samples prior to analysis. Phospho proteins have rapid kinetic profiles and sample stability is a primary concern, particularly for whole blood assays. Synexa developed and validated an on-site procedure for sample stabilisation which provided up to 35-days of sample stability.

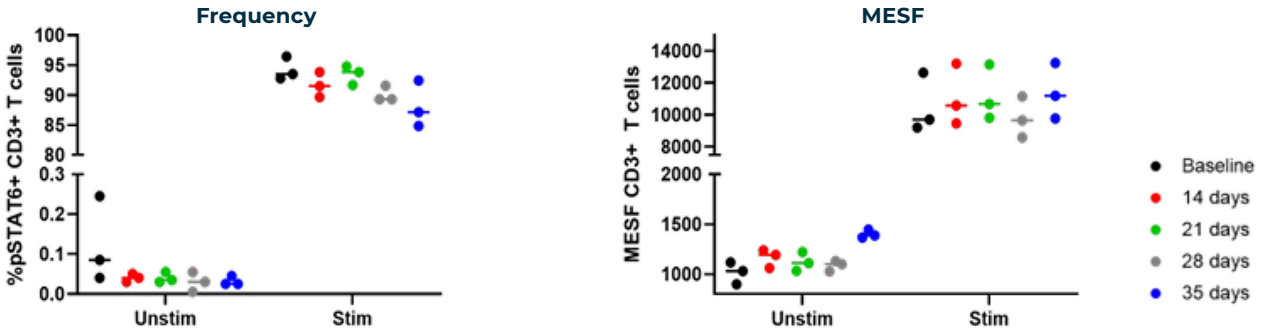

Figure 2. pSTAT6 expression in stabilised blood from baseline to Day 35.

*Synexa has also developed assays for pSTAT3 and pSTAT5.