

Potential Biomarkers for the Lung^{8,20,28}

Considerations for Potential Biomarkers

(Please determine whether the parameters identified in each column would/would not apply to the biomarker.)

Potential Biomarkers	Useful for predicting human disease or increased risk of disease	Useful for rodents	Detects tissue injury or altered function	Useful for detection of alterations across many diseases	Methods for human analysis applicable to rodent specimens	Other Special Concerns: e.g., specific time(s) for biomarker measurement; additional animals needed
<i>Lavage Fluid Analysis</i>						
Beta-Glucuronidase ^{3,8,18,28}						
Lactate dehydrogenase ^{3,7,8,11,18,28,29}						
Alkaline phosphatase ^{8,18,28}						
N-Acetyl glucosaminidase ^{11,24}						
Gamma-Glutamyltransferase ¹¹						
Glutathione ^{11, 28}						
Glutathione reductase/peroxidase ¹⁸						
Total protein ^{3,7,9,11,16,18,24,28,29,31}						
Albumin ¹¹						
Cell counts/differential ^{2,6-9,11,15,16,18,21,23,24,28}						

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<i>Lavage Fluid Analysis cont'd</i>						
Interleukins (1, 2, 4, 5, 6, 8, 10, 12, 13) ^{2,6,8,9,13,23,29}						
Tumor necrosis factor alpha ^{6,8,9,15,23,28,29}						
Macrophage inflammatory protein-2 ^{8,9,15,23,28}						
Transforming growth factor-beta ^{6,9,30}						
Macrophage chemoattractant protein-1 ⁸						
Platelet-derived growth factor ^{5,6}						
Prostaglandins (PGE ₂ , PGD ₂ , LTB ₄) ⁶						
Intercellular adhesion molecule-1 ¹⁵						
Interferon-gamma ²						
Immunoglobulins (IgE) ²⁹						
Chemokine mRNA						

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<i>Serum Analysis</i>						
Fibrinogen ¹¹						
Immunoglobulins (IgE, IgG, IgM) ^{2,16,18,29}						
Clara cell protein (CC16) ⁴						
Surfactant-associated proteins ⁴						
<i>Respiratory function</i>						
Plethysmography ^{9,11,15,16,19,23,29}						
Internal surface area/external volume ^{18,19}						
Exhaled markers of inflammation (isoprostanes, leukotrienes) ¹⁰						
<i>Tissue Analysis</i>						
Interferon-gamma ^{16,21}						
Tumor necrosis factor alpha ¹⁶						
Interleukins (4, 5) ¹⁶						

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<i>Tissue Analysis cont'd</i>						
Hydroxyproline ⁶						
Collagen ¹⁸						
Monocyte chemoattractant protein-3 & receptor ²¹						
Transforming growth factor-beta ²²						
<i>Tissue Pathology</i>						
Morphometry ^{12,18,19,26}						
Electron microscopy ²⁶						
Trichrome stain ^{7,22}						
Sirius red stain ¹²						
Periodic acid-Schiff ²²						
Immunohistochemistry ^{6,7,21,22}						

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Gene Analysis (Lung) 5,17,20,24,25,30,31						
Genes of Inflammation						
Growth factors						
Regulators of NADPH oxidase						
Cell proliferation						
Fatty acid metabolism						
Platelet-derived growth factor						
Metalloproteinases						
Amyloid A1						
Proteomic Profiles						
Lavage fluid ^{14,27}						
Lung ^{6,13}						
Imaging (computed tomography) ¹						

Lung References

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