A Human Progenitor Mast Cell Line for Allergic and Fibrotic Research and Therapeutic Screening

Description of Technology: Hermansky-Pudlak Syndrome type-1 (HPS-1) is a rare genetic disorder that affects around 1 in 500,000 people worldwide and 1 in 1,800 Puerto Ricans. Patients with HPS-1 display oculocutaneous albinism, bleeding due to platelet abnormality, and pulmonary fibrosis. Those that develop pulmonary fibrosis often succumb and live no more than a decade after early onset of breathing problems.

Scientists at the National Institute of Allergy and Infectious Diseases (NIAID) have developed the HPS-1 proMastocyte (HPM) cell line, containing an HPS-1 mutation. This cell line resembles a progenitor mast cell with reduced granule formation, significant chemotactic ability, and is the first mast cell line shown to constitutively release cytokines, chemokines, and most importantly fibrotic proteins. This cell line serves as a model to study granule formation, early mast cell development, chemotaxis and mechanisms controlling synthesis of molecules contributing to fibrosis.

The cell line is available as live cells approximately 3–4 million cells per sample in a T25 Flask.

Potential Commercial Applications:
- A tool to further understand fibrosis
- A tool to study granule formation, early mast cell development, degranulation and chemotaxis
- Screening tool to identify target compounds for the treatment of pulmonary fibrosis

Competitive Advantages:
- First progenitor mast cell line known to produce fibrotic elements
- Progenitor mast cell line with rapid growth, no cytokine stimulation needed. Cell doubling time of 2–3 days

Inventors: Arnold S. Kirchenbaum and Dean D. Metcalfe, both of NIAID.

Publications:
Kirchenbaum AS et al. Immunophenotypic and Ultrastructural Analysis of Mast Cells in Hermansky-Pudlak Syndrome Type-1: A Possible Connection to Pulmonary Fibrosis.; eLife 2016, 5:e22007. PMID 27459687


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Collaborative Research Opportunity: The National Institute of Allergy and Infectious Diseases is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize this invention. For collaboration opportunities, please contact Dr. Dianca Finch; 240–669–5503, dianca.finch@nih.gov.

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