IIT MADRAS
Indian Institute of Technology Madras

Technology Transfer Office
TTO – IPM Cell

Industrial Consultancy & Sponsored Research (IC&SR)

Self-labeled Fusion Proteins for Ex Vivo Immunophenotyping of C-kit Receptor

IITM Technology Available for Licensing

Problem Statement

- Current methods for detecting **c-kit expression** in cancer, allergies, and autoimmune disorders **suffer from inconsistencies** due to **variations** in **antibodies and fluorochromes used**.
- Antibody-based detection are **complex, costly methods, poses immunogenicity issues.**
- **Standardization** of c-kit expression detection is **challenging** due to **heterogeneous results from different labs.**
- Hence, there is a need for **reliable alternative** to **antibody-based detection methods for accurate diagnosis and prognosis** in cancer and related diseases.

Technology Category / Market

Biotechnology and Genetic Engineering | Drugs and Pharmaceutical Engineering

Industry: Healthcare, Pharma, Biotechnology

Application: Cancer diagnosis and prognosis, Immunophenotyping in leukemia and solid tumor, Allergy and autoimmune disorder diagnostics, Biomarker detection & monitoring, Drug development and personalized medicine

Market: Global Fusion Protein Market size was valued at **USD 24.58 Billion in 2023** and is expected to reach **USD 32.56 Billion by 2030**, at a **CAGR of 4.1%** from 2023 to 2030.

Technology

The technology disclosure introduces a **method** for **detecting expression** of **c-kit receptor**, which is crucial in various diseases including cancer, allergies, and autoimmune disorders.
This **antibody-based detection method utilizes self-labeled fusion proteins,** consisting of stem cell factor **(SCF)** fused to **SNAP-tag**, allowing for covalent binding to detectable agent.

Intellectual Property

IITM IDF No: **1351;** IN IP No: **415316 (Granted)**

TRL (Technology Readiness Level)

TRL - 4, Experimentally validated in lab.

Research Lab

Prof. Rama S Verma, Dept of Biotechnology

The Process Involves Following Steps:

Genetic Engineering

- Fusion constructs of SCF fused to a SNAP tag are cloned into a mammalian vector.

Transfection

- The fusion protein probe is transfected into host cells for genetic expression.

Purification

- The expressed fusion protein probe is purified from the transfected culture.

Labeling

- The probe is labeled with a detectable agent, typically benzylguanine or a derivative thereof with a fluorophore.

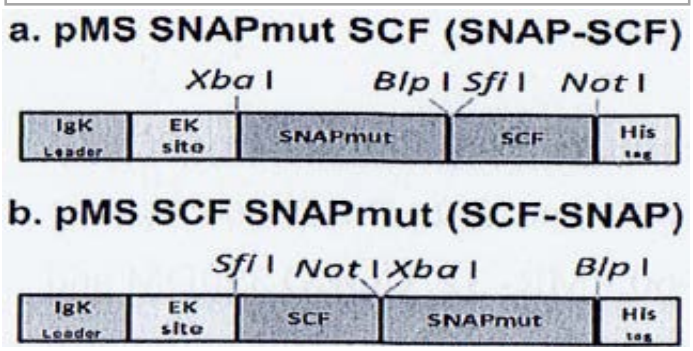

FIG. 1: Schematic representation of SNAP conjugated SCF fusion constructs
a. pMS SCF-SNAP (N-terminal
b. pMS SNAP-SCF (C-terminal)

Key Features / Value Proposition

- **Simplicity**: The production process is simpler compared to antibody production.
- **Cost-effectiveness**: It is more cost-effective than antibody-based methods.
- **Specificity**: The fusion proteins exhibit high specificity for detecting c-kit expression.
- **Stability**: The SCF fused SNAP-tag is stable for extended periods, even at refrigerated temperatures.

CONTACT US
Dr. Dara Ajay, Head
Technology Transfer Office,
IPM Cell- IC&SR, IIT Madras

IITM TTO Website:
https://ipm.icsr.in/ipm/

Email: smipm-icsr@icsrpis.iitm.ac.in
sm-marketing@imail.iitm.ac.in
Phone: +91-44-2257 9756/ 9719