My Research Odyssey

"Venturing to Decode Cancer: Mona Sheta's Journey 🚀"

Cancer Gene / pathway Discovery

- TPM
- BAM
- STAR
- FASTQC
- Data - Analysis / visualization (R – Programming)
- NGS & Proteome for Expressed Cancer Genes
- Meta – Analysis
- Cancer cell lines
- Conditioned media
- Deciphering Cancer Gene Expression Patterns

EV proteome of metastatic tongue carcinoma cells (unpublished).

RNA & Proteome highly expressed in tumoroid-EVs and MMP3-KO-tumoroid-EVs (unpublished).

Discovery integrin/focal adhesion/PI3K/AKT signaling pathway Figure 5 in (Sheta et al 2021 Cancer Letters)

Discovery and targeting of metabolism kinase in cancer organoid EVs (Sheta et al, Poster in JSEV Conference).

MEK1/2 is a bottleneck that induces cancer stem cells to activate the PI3K/AKT pathway. (Sheta and colleagues, 2021 BBRC).

Supplementary Figure 1: Meta-analysis Results in (Sheta et al 2021 Cancer Letters).

Differentiation of cancer stem cells into erythroblasts in the presence of CoCl2. (Sheta and colleagues, 2021 Scientific Reports).

Microenvironment of mammary fat pads affected the characteristics of the tumors derived from the induced cancer stem cells. (Sheta and colleagues, 2021 Am J Cancer Res.).

Cancer extracellular vesicles, tumoroid models, and tumor microenvironment. (Sheta and Colleagues, 2022 Seminars in Cancer Biology).

Loading EVs with Drug / siRNA

- Electroporation
- Drug Delivery through EVs

Electroporation and Transfection of EVs in Cells: A Methodological Approach (unpublished).

Extracellular Vesicles as a Drug Carrier for Targeting Cancer Metabolism Kinase (unpublished).

Mapping EVs Biodistribution (Organotropism)

- IVIS System
- EVs Biodistribution Dynamics

Biodistribution Analysis of Glu-Labeled EVs Using In Vivo Imaging System (unpublished).

Chronic Inflammation

- Unraveling Stem Cell Niche Dynamics
- FGF2
- iPSCs
- Generating Cancer Stem Cell model

Chronic exposure to FGF2 converts iPSCs into cancer stem cells with an enhanced integrin/focal adhesion/PI3K/AKT axis. (Sheta et al 2021 Cancer Letters).

MSV / Exosomes / Autophagic exosomes

- Investigating Autophagic Inhibitors alter EV release
- Investigating Mitochondrial Inhibitors alter EV release
- Investigating MPP Inhibitors alter EV release

Extracellular Vesicles: New Classification and Tumor Immunosuppression (Sheta et al biology 2022).

Attempt at Suppression of Head and Neck Cancer and Reversal of Cisplatin Resistance by Mitochondrial Molecular Inhibition and Autophagy Inhibition (unpublished).

Metalloproteinase inhibitors inhibits the expression of surface markers on extracellular vesicles from oral squamous cell carcinoma (unpublished).

Investigating Epithelial Mesenchymal Transition

- Exploring Lentiviral Tumor Tracking
- SCAND Overexpression

Stress-Inducible SCAND Factors Suppress the Stress Response and Are Biomarkers for Enhanced Progress in Cancers. (Sheta et al International Journal of Molecular Sciences 2022).

SCAND1 Reverses Epithelial-to-Mesenchymal Transition (EMT) and Suppresses Prostate Cancer Growth and Migration (Sheta and colleagues, Cells, 2022).

Breast cancer prognostic marker

- siRNA Transfection
- Antagomir-mediated suppression of microRNA

MiRNAs-181a/b as Predictive biomarkers for Olaparib sensitivity in triple-negative breast cancer cells. (Sheta et al 2017 Biochemistry Letters)

Syndecan-1 (CD138) as a pathogenesis factor and therapeutic target in breast cancer (Sheta et al 2021 Current Medicinal Chemistry).