Measures with Ultrasound Contrast Agents

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Contrast-Enhanced Ultrasound
Monitoring Tumor Response to Therapy

Week 0  Week 12  Week 24

Image score

Study duration (weeks)

Week 0  Week 12  Week 24
Contrast-Enhanced US Imaging

Volumetric Strategies


Volumetric Contrast-Enhanced US

Analysis of Spatial Variation

**Chemotherapeutic Monitoring**

Tumor cell implantation

21 days

US imaging

Therapy dosing

Endpoint analysis

- Post baseline schedule (days)

- Therapy dosing

- Endpoint analysis

- Tumor perfusion (% change)

- Time (day)

- Control

- Abraxane

- TRA-8

- TRA-8 + Abraxane

- Tumor volume (% change)

- Time (days)

- Control

- Abraxane

- TRA-8

- TRA-8 + Abraxane

- Survival probability (%)

- Time (days)

- Control

- Abraxane

- TRA-8

- TRA-8 + Abraxane


**Targeted MB Contrast Agents**

**STRATEGY**

Label US contrast agents with antibodies/peptides that selectively bind to molecules that are overly abundant in diseased tissue

- Ligand

- Target

- Microbubble

Normal MBs

Targeted MBs
Molecular Ultrasound Imaging

**Head and Neck Cancer**

Control Ab MBs  Anti-EGFR Ab MBs  Anti-CD147 Ab MBs  Dual Ab MBs

SCC-1 Flank Tumors

![Graph showing Image Intensity (au) for different MBs: IgG, Anti-EGFR, Anti-CD147, and Dual Ab.]

**Molecular Ultrasound Imaging**

**Tumor Angiogenesis**

![Images of MBs labeled MB_c, MB_s1, MB_s2, MB_s3, MB_p1, MB_p2, MB_p3, and MB_i, with annotations for different antibodies and imaging techniques: αβ3, P-selectin, VEGFR2, and H&E.]


Molecular Ultrasound Imaging
Monitoring Antiangiogenic Therapy


Collaborators

Laboratory Members
Marshall Mahoney, BS
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"Wonderful! Just wonderful! ... So much for instilling them with a sense of awe."