

PHILIPS

Therapy Imaging Probe System

Ultrasound Mediated Delivery

- Application: Local gene delivery and transfection using radiation pressure and cavitation



Images courtesy of A. van Wamel

Confidential

CRS Soapbox Session, RS, Sunday, July 13, 2008

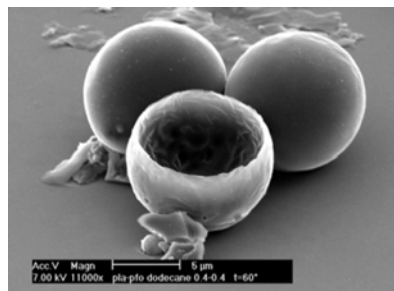
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Ultrasound Mediated Delivery

- Application: Targeted drug delivery with drug-bearing microcapsules using mechanical excitation



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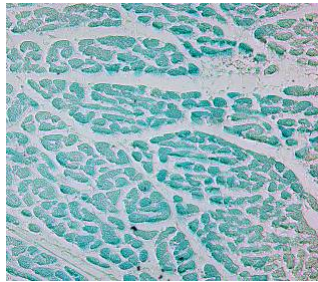
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Therapy Imaging Probe System

Ultrasound Mediated Delivery

- Application: Site-specific regulation of gene expression via ultrasound induced hyperthermia, ultrasound induced heat shock, or mechanical stimulation



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Ultrasound Mediated Delivery

- Application: Permeabilization of plasma membranes (sonoporation) using cavitation or ultrasound contrast agents for increased therapeutic molecule uptake by the cells



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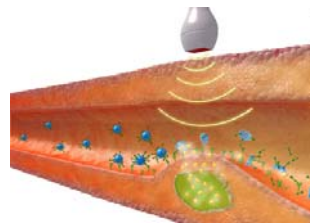
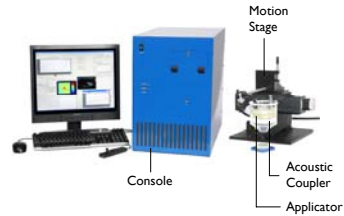
Therapy Imaging Probe System

Description

TIPS is a general purpose tool that allows scientists to perform pre-clinical research using high-intensity focused or therapeutic ultrasound in the areas of:

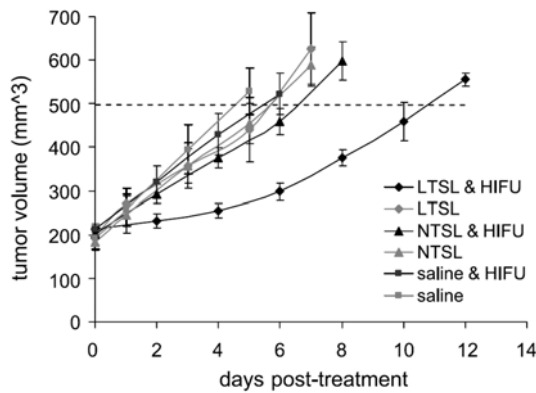
- Ultrasound Mediated Gene Therapy / Transfection
- Site-Targeted Drug Delivery
- HIFU / Ablation
- Sonothrombolysis
- Acoustic Radiation Force Imaging
- Ultrasound Mediated Immunotherapy

Image-guided, site-targeted, non-invasive



Therapy Imaging Probe System

Example: Doxorubicin Delivery with Low-Temperature Sensitive Liposomes (LTSL)



S.Dromi et al Clin Cancer Res 2007;13(9)

Experiment Details:

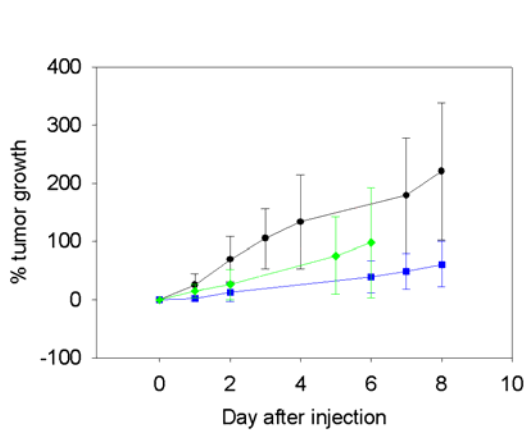
Murine Mammary Adenocarcinoma Model

Exposure Parameters:

- 1.0 MHz
- 100 ms 'ON' Pulse
- $I_{SATA} = 1300 \text{ W/cm}^2$
- PRF = 1 Hz
- 120 pulses/site
- 2 mm site spacing

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Example: Paclitaxel Delivery with Microbubbles



- Control (Saline Injection)
- Paclitaxel Injection
- Paclitaxel Injection + Ultrasound Exposure

Experiment Details:
Murine Colon Cancer Model

- Exposure Parameters:
- 1.2 MHz
 - 300 us 'ON' Pulse
 - MI = 1.5
 - 10 s Total Exposure
 - 1 mm site spacing
 - PRF ≈ 1 kHz

Therapy Imaging Probe System

TIPS at CRS 2008

Visit us at Booth 1511 for additional information and a hands-on demonstration.

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