

**Medical
Gel dosimetry
Systems**

Our Proprietary Products and Services:

BANG® Gels are human tissue-equivalent gels infused with monomers that polymerize locally in proportion to the absorbed radiation dose. The submicron-sized polymer particles scatter visible light, which results in the appearance of a white cloud in the gel. As the particles are trapped in the gel, the spatial distribution of optical density in the gel is permanent and represents precisely the dose distribution. It can also be viewed and measured using T2-weighted spin-echo MRI. **BANG gels are FDA-approved for clinical use.**

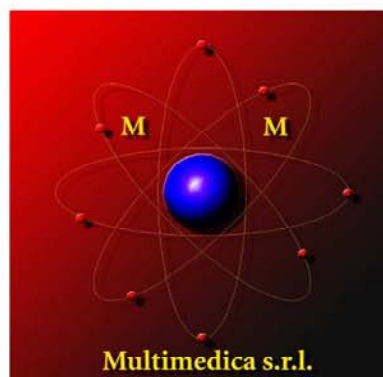
OCTOPUS™ laser CT scanners digitize the dose distribution information stored in an irradiated **BANG gel**, and reconstruct the complete 3D dose distribution data with high accuracy and spatial resolution. **OCTOPUS™ scanners** are robust, economical, and very easy to operate.

QA-BY-MAIL™ service delivers clinical 3D gel dosimetry with no capital equipment cost and minimal QA time at the hospital. We provide the ready-to-use gels, that only need to be irradiated and shipped back to us for optical CT scanning. We deliver the complete 3D data electronically. We also take care of the gels' disposal.



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**Forget the film!
Switch to 3D!**

**BANG®-Gel-QA™
for
Radiotherapy**



BANG®-Gel-QA™:

- **Best insurance against critical error**
- **Saves hospitals QA time and money**
- **The only truly 3-D “target practice”**

BANG®-Gel-QA™: Example

MGS Research is the only commercial vendor in the world to provide radiotherapy and radiosurgery clinics with the complete 3D visualization and 3D measurement of radiation dose distribution to be delivered to patients, just in time to make corrections necessary to deliver exactly what the surgeon or the oncologist had planned for each patient.

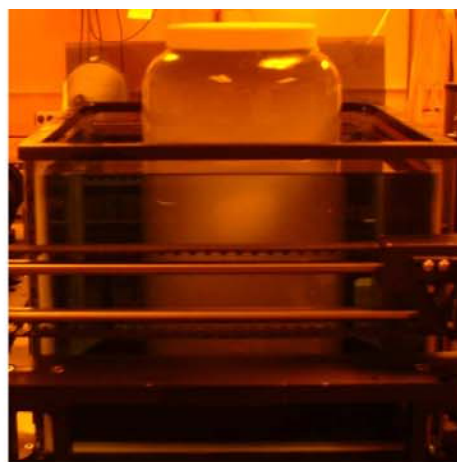
BANG®-GEL-QA™ quality assurance system

is based on our proprietary technologies:

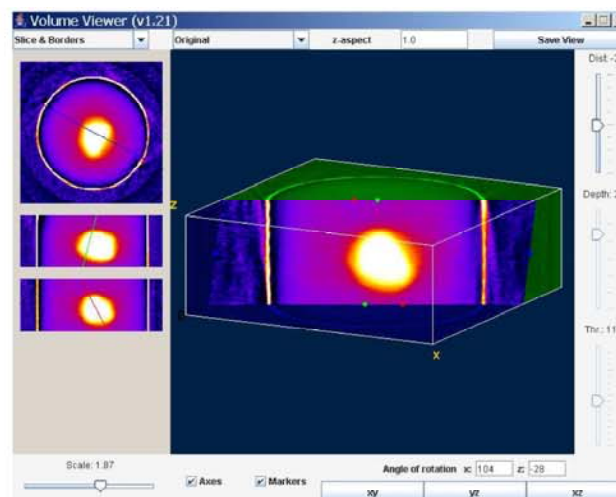
- Human tissue-equivalent BANG® polymer gel dosimeters (FDA-approved for clinical use!)
- OCTOPUS™ tomographic laser scanners for digitizing 3D BANG® gel data.

Selected Literature:

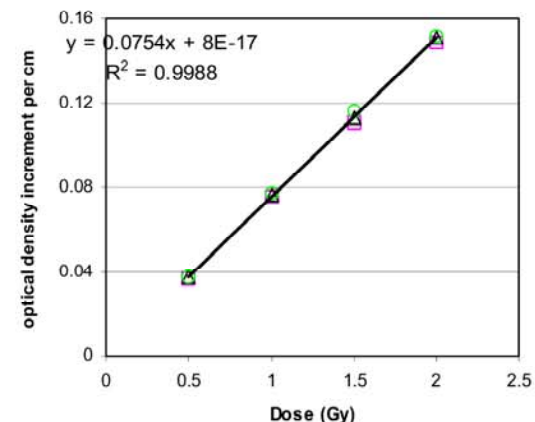
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- Pappas et al, *Narrow stereotactic beam profile measurements using N-vinylpyrrolidone based polymer gels and MRI*, Phys Med Biol Vol 46, No. 3, 783-797 (2001)
- Novotny et al, *Measurements of Relative Dose Distributions in Stereotactic Radiosurgery by the Polymer-Gel Dosimeter*. Radiosurgery 5, 225-235 (2004)
- Xu et al, *Performance of a commercial optical CT scanner and polymer gel dosimeters for 3D dose verification*. Med. Phys 31 (11), pp.3024-3033, (2004)
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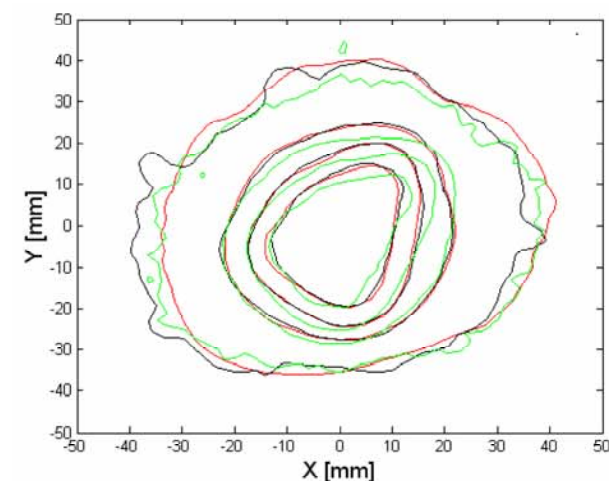
An irradiated BANG® gel phantom positioned in the OCTOPUS™ scanning tank.



Interactive axial, coronal, sagittal and volume views of the 3D dose distribution in BANG® gel, reconstructed by the OCTOPUS™ scanner.



BANG gel dose response for 6MV and 10MV photons and 12MeV electrons (from Xu et al, AAPM 2004)



Effect of the isocenter shift. Isodoses from BANG gel # 1 (black line), BANG gel # 2 (green line) and the treatment planning system (red line) in an axial slice at $z = 8$ mm; isodoses from inside to outside are 180cGy, 150cGy, 100cGy and 50cGy. BANG gel # 1 is in agreement with the plan while BANG gel # 2 shows isodose displacement due to isocenter shift at different gantry/couch angles (Courtesy of Prof. Cheng-Shie Wu, Director of Medical Physics, Columbia Presbyterian Medical Center, New York, NY).