



## Fully Automated Subcutaneous Tumor Measurement & Tracking System

- Make accurate tumor volume measurements
- Improve statistical significance
- Eliminate manual data transcription errors
- Reduce operator dependence up to 3-fold
- Decrease manual repetitive tasks
- Increase productivity
- Reduce labor costs (up to 50%)
- Reduce animal costs (up to 35%)
- Validate cross-laboratory results
- Shorten time to IND



### Tumor Management System

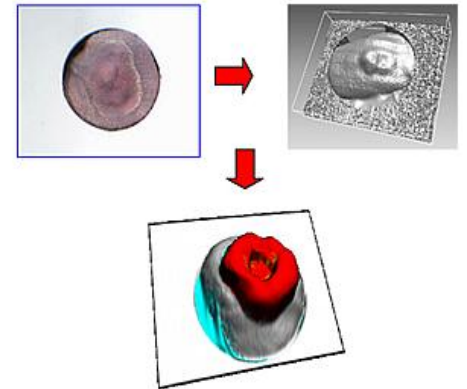
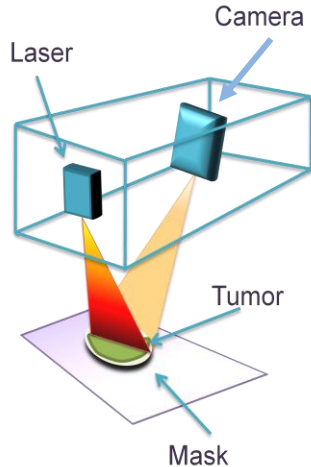
A Complete Solution for  
Subcutaneous Tumor  
Measurements



**Bioptron Corporation**

*Discovery through Imaging*

# TumorImager™ provides the most accurate results...



**TumorImager™** is a 3D laser scanning device for subcutaneous tumor measurements on small lab animals. It uses a laser and camera system that projects a laser line on the tumor to be measured. As the laser line moves over the tumor placed within the mask, the camera takes pictures of the line and calculates the x, y, and z coordinates of the surface of the tumor. The patented algorithms then segment the tumor out of all the data points and calculate the volume. This leads to more accurate volumes than the simple formulas assumed when using calipers.

**TumorImager™** measures the volume of necrotic tumors as well as odd shaped tumors. The volume of such tumors cannot be measured accurately using calipers.

## Comparison with Caliper Measurements

Function	Caliper	TumorImager™
Average deviation <sup>1</sup>	-0.36	-0.02
Measurement time <sup>2</sup>	7-10sec	3.5 sec
Recording time <sup>3</sup>	9 sec	0 sec
Tumor shape dependency	Half ellipsoid	Shape independent
Tumor size (long axis)	Any	0.5-2.8 cm
Operators needed	1-2	1

1. Average of deviations from plethysmometer measurements (mm<sup>3</sup>)

2. Time for making one tumor measurement.

3. Time to record results to paper/Excel or to a database.

## TumorImager™

- Accurate volume measurements
- Fast (results in 3.5 seconds)
- Real time data analysis
- Sedation of animals for measurement process is not required
- Highly Reduced operator dependence
- Tumor Shape independent measurements
- Measure necrotic tumors accurately
- Save scanned tumor images automatically for further analysis
- Validated data



# TumorManager™ automates data management ...



The integrated program controls the scanner plus collects and manages tumor data for oncology drug research. It consists of study protocol creation; tabular and graphical presentation of individual and group animal volume, weight and clinical observational data; real time tumor metric calculations; statistical analysis; survival tests; integrated randomization of animal grouping; cage handling; task management; and extensive reporting of results.

## Comparison with Current Processes

Function	Typical Lab	TumorManager™
Data recording	Spreadsheet	SQL Server Database
Statistics	Limited	Extensive
Data protection	Password	Database, password, task and user dependent
Tumor metric calculations	If calculated they are not real time.	Real time calculations of Volume, TDT, LogCellKill etc.
Data display	Requires programming	Real time table/ graphs
Animal grouping	Either manually or by use of a program	Volume/weight based randomization integrated
Reports	Tables, manual transfer to Word, pdf, Excel etc.	36 reports on protocol, data and analysis integrated

## TumorManager™

- **Multiple data entry**  
TumorImager™  
Balances
- **Multiple Tumor Metrics**  
T-C, TDT, TGI, TVDD  
Log Cell Kill  
Tumor Inhibition
- **Protocol driven**  
Study creation  
Measurements  
Task scheduling  
Dosing  
Animal Fate  
User defined terms
- **Animal Randomization**  
Animal ID  
Tumor Volume  
Body Weight  
Weight stratification  
Manual
- **Statistical Analysis**  
Descriptive  
Normality,  
Homogeneity  
Correlation  
ANOVA  
Multiple Comparisons
- **Reports**  
36 reports  
Word, PDF and html exports



# Tumor Management System: A Complete Solution

Studies have shown that with the TumorImager's more accurate volume data, P-values are better, Dose Response curves are more sensitive and differences can be detected earlier in xenograft studies than is possible with calipers.

## TumorImager™ Specifications

- |                                |                    |
|--------------------------------|--------------------|
| • Scan range (along x axis)    | 35 mm              |
| • Camera working distance      | 100 mm             |
| • Maximum tumor size along x-y | 25 (28) mm         |
| • Maximum tumor height         | 18 mm              |
| • Tumor scan time              | 3.5 sec            |
| • Resolution, z axis           | 0.04% (10 μm)      |
| • Linearity, z axis (±3 sigma) | 0.2% (50 μm)       |
| • Light source laser diode     | 655 nm, 15 mW      |
| • Laser class                  | Class 2M           |
| • Computer Interface           | Firewire & USB 2.0 |
| • Interface cable length       | Up to 6ft          |

## TumorManager™ Specifications

- Windows based functionality such as data entry through mouse, touch screen, and foot pedals.
- Protocol driven functions such as data entry, dosing and task generation.
- Program limits: 20 groups/study, 100 animals/group, 20 drugs/study.
- Interfaces to TumorImager™, serial balances, calipers and RFID readers.
- SQL Server 2005 backend.
- Secured program and database.
- Report generation for volume/weight data & plots.
- Reports can be exported to Word, Excel, HTML.
- 21 CFR Part 11 compliant.

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