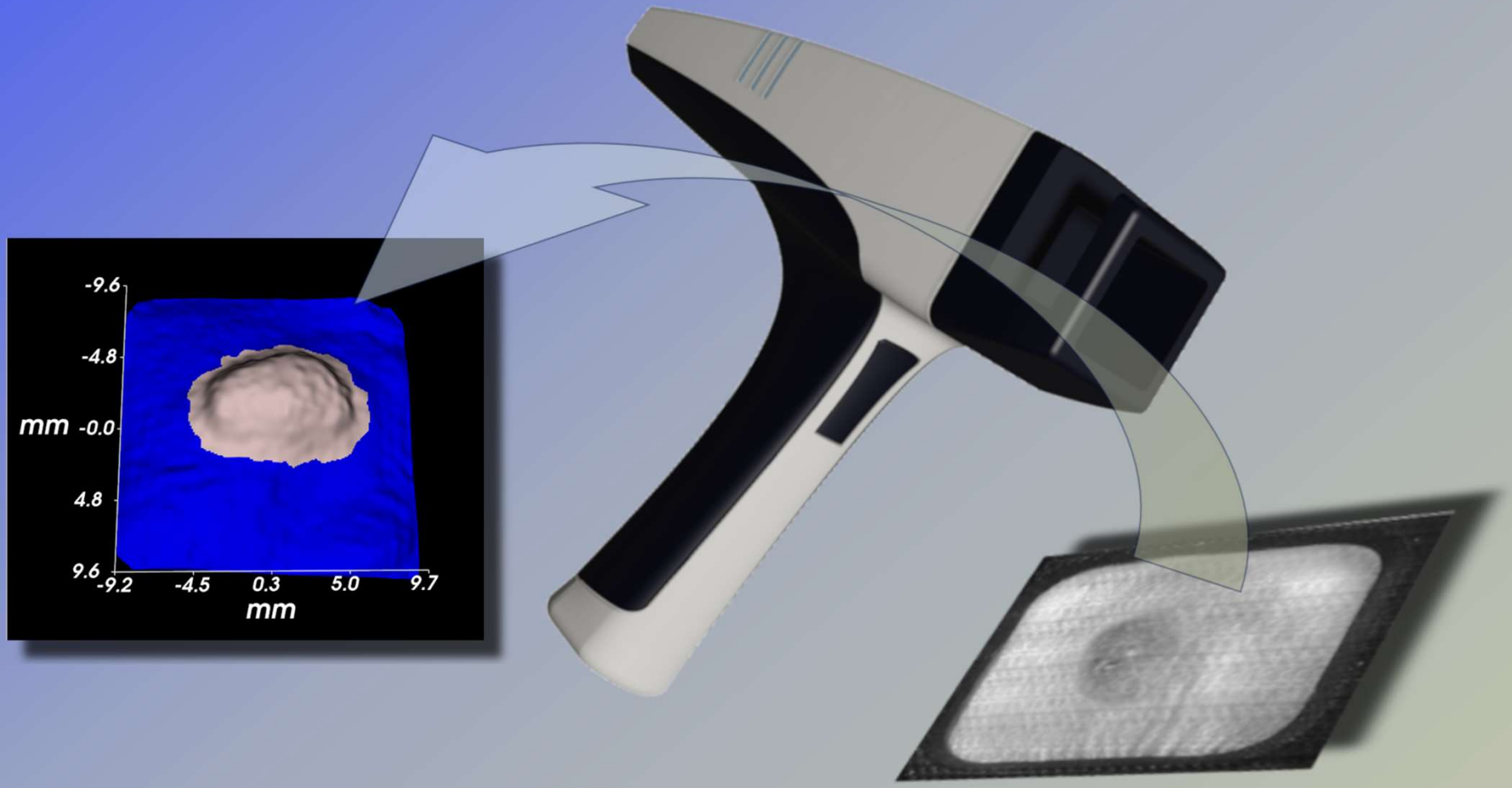
The TM900v2: A novel device for 3D measurements of xenografts in mice



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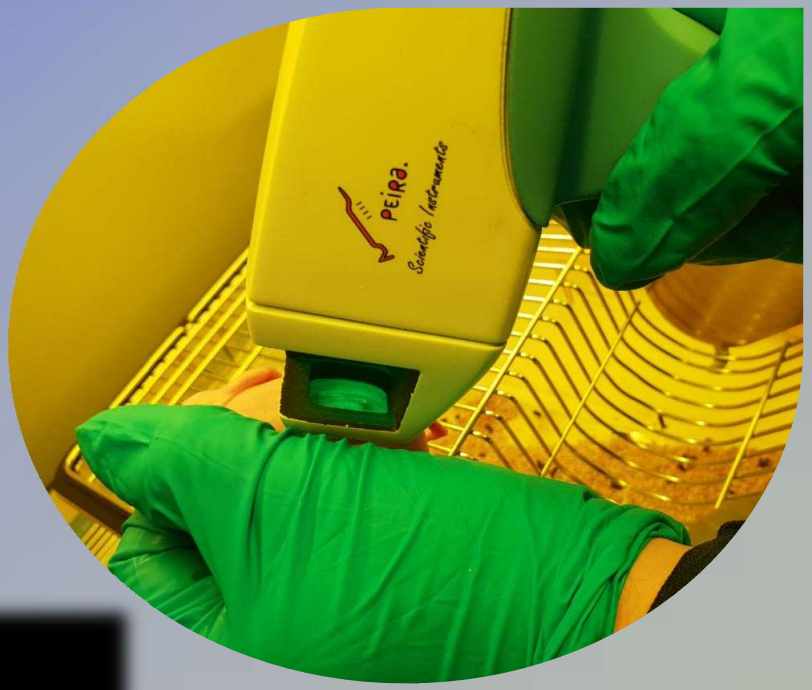

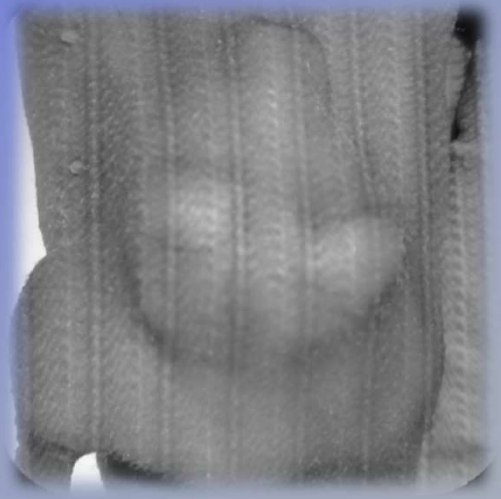

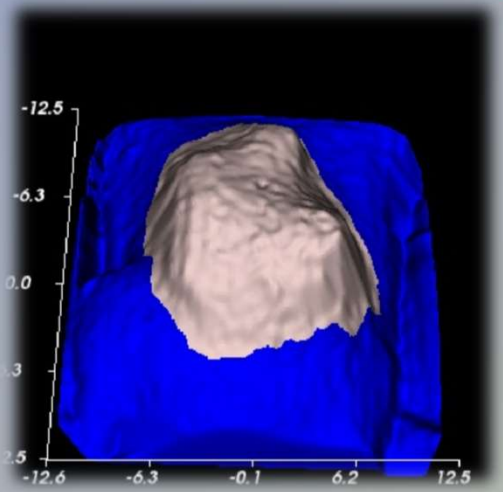

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Rational:

Measurement of tumor sizes is important in preclinical animal studies, when assessing responses to cancer treatments. Sequential measurements of tumor volume with a non-invasive method are essential. The current standard technique for volume determination of subcutaneously xenografted tumors is measuring the length and width of the tumor with a caliper. However, caliper measurements are prone to error due to e.g. variability and compressibility of the tumor. An alternative for these measurements is the TM900v2, a direct 3D measurement method.

The TM900v2 is an innovative, non-invasive accurate and easy to use handheld device for direct 3D measuring tumor volume in subcutaneous mouse xenografts in vivo.

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Principle:

Mice are injected in the flank(s) with tumor cells. The tumor volume is measured over time by positioning the nozzle of the device over the tumor and pressing the button. The TM900v2 acquires the 3D images of the topography of the tumor based on stereo vision; a structured light pattern is projected of the surface. The deformation of the pattern is used to calculate the topography and subsequently, the volume of the tumors.

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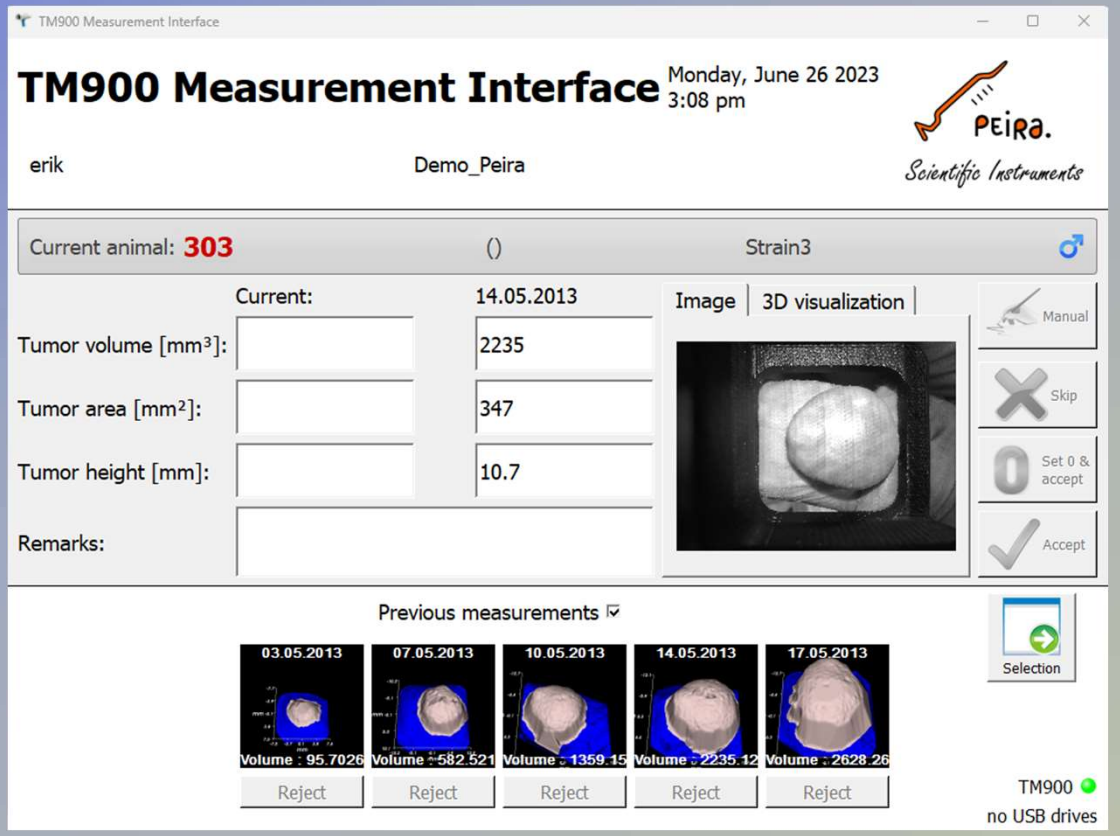
TM900: A complete platform

The TM900v2 is a complete platform; besides the handheld device, the TM900v2 comes with a touch screen laptop PC, a measurement and a management software. **The measurement software** makes the image acquisition and allows visualizing the tumor topography and the analyzed surface. Important tumor features such as volume, height, width and depth are automatically calculated. Previous measurements of the animal are shown on the screen to allow instantaneous follow-up of the tumor volume over time. The software interface also allows coupling other hardware such as balances, facilitating complementary measurements. An export function is foreseen to export the data to the management software for further analysis.



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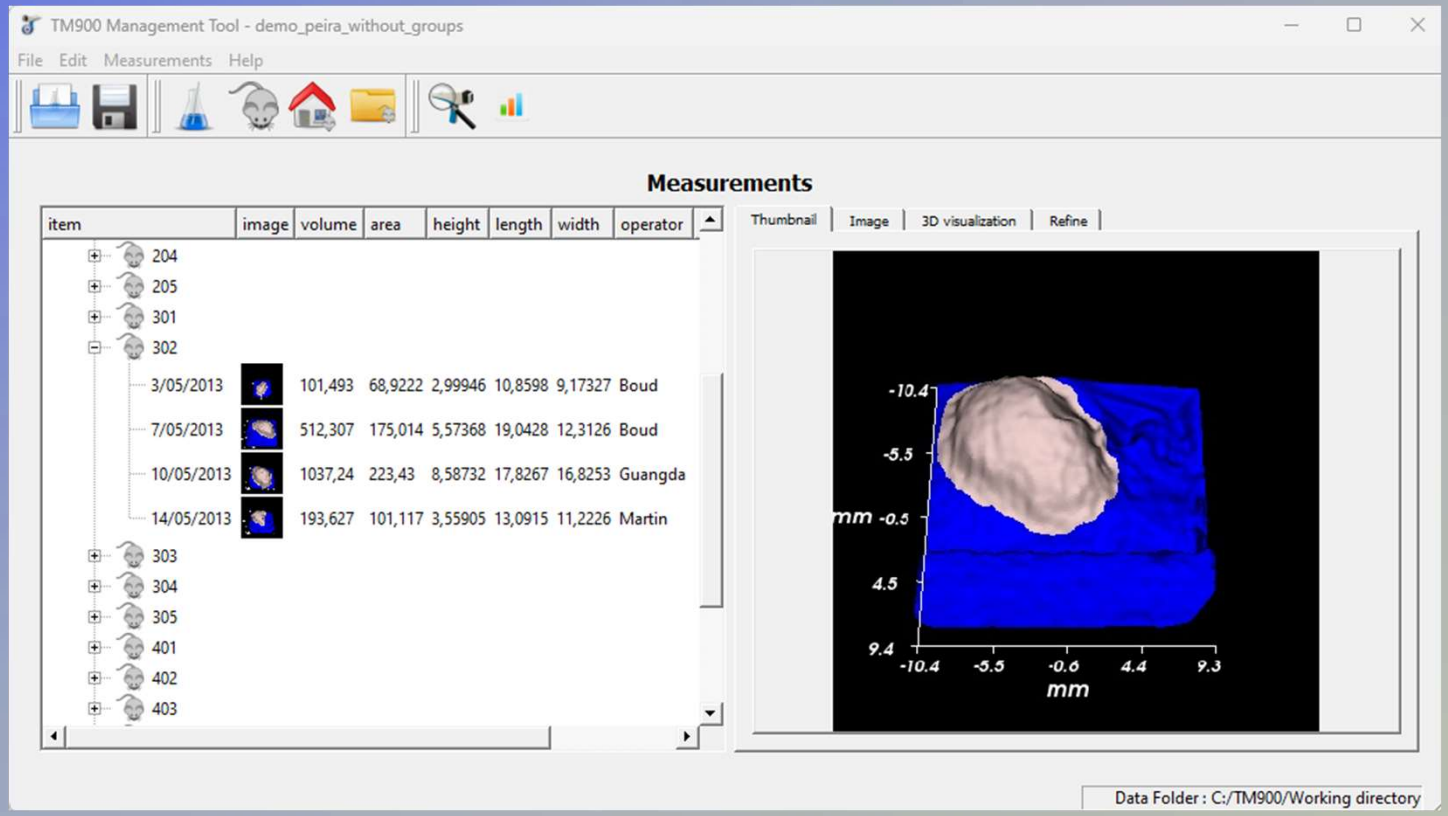
The management software allows for a complete data management of your experiment data. You can define experiments, assign animals to groups (randomization), visualize the tumors and make plots of data. Export to e.g. Excel is foreseen.



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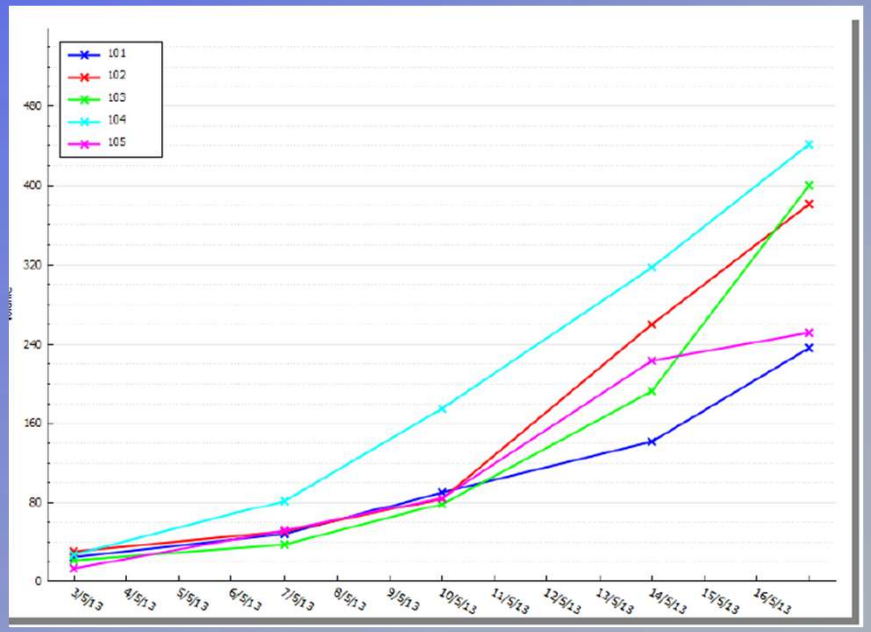

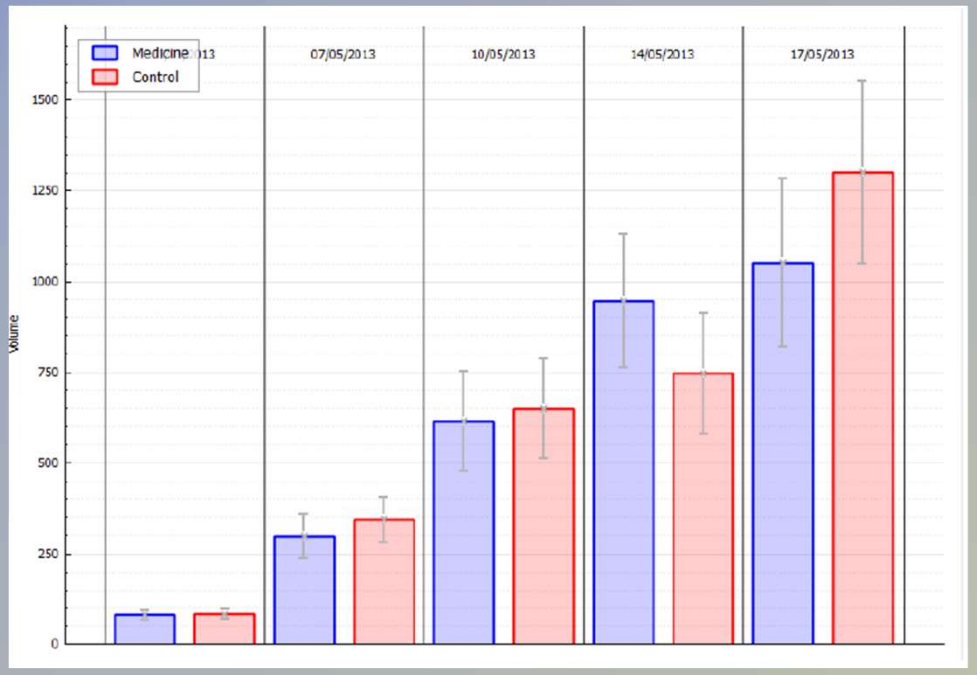

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Why the TM900:

- **Visualization in 3D** of the tumor topography. This allows for visual inspection of the tumor shape an morphology over time and flagging of the necrotic or inflamed tumors.
- **Data integrity and traceability.** The software allows for storage, analysis, visualization and management of data, which is essential for robust data follow-up and QA-requirements.
- **Validation.** High resolution 3D images are acquired, allowing precise volume estimations and validation of the measured surface?. Especially oddly shaped or thin tumors benefit from the TM900v2 volume estimations.

Specifications:

- Measurement range (X – Y) 25mm-25mm (optional 30mm-30mm)
- Maximum tumor size (LxWxH) 20mmx20mmx20mm (optional 25x25x20)
- Accuracy per measurement 3D point: <0.3mm
- Device, touchscreen laptop PS: USB 3.0
- Cameras: 1920x1080 pixels
- Projector: 300x300 pixels, 532nm (green for optimal contrast on nude, black and white mice)
- Camera/projector working distance 50mm
- 3D algorithm calculation: <2sec (depending on processor used)

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System requirements:

Touch screen laptop PC

- Intel Core i5, preferably i7 or better, min speed 2.6Ghz
- 8GB of RAM and 266MB of available disk space for program installation
- Min 2USB ports for the TM900 and USB flash drive, optionally extra ports for balance.
- Operation systems Windows 10 or 11 pro or home.

Contact

Contact us at:

by e-mail: erikbuelens@budetec.be

https://budetec.be/contact/

https://tumorvolume.com/contact/