
中国医学科学院肿瘤医院深圳医院
CANCER HOSPITAL CHINESE ACADEMY OF MEDICAL SCIENCES, SHENZHEN

**Theme: Physics**

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# Abstract Title: End-to-end Assessments of SPR Conversion Curves in Proton Therapy Incorporating Planar Dose and WET Measurements through Animal Tissue Sample Irradiation


Jianan Wu, Yuchao Hu, Zhen Ding, Yang Li, Chenbin Liu, Meiling Xu, Yajun Jia, Enzhuo Quan
Cancer Hospital Chinese Academy of Medical Sciences, Shenzhen, Shenzhen, China


## Background / Aims:

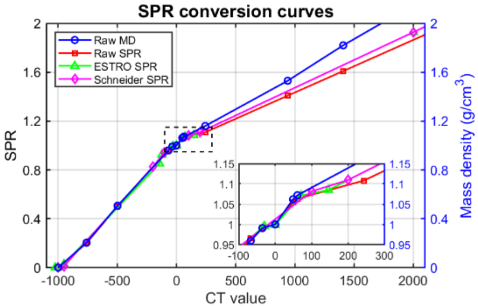
- Stopping power ratio (SPR) conversion curves were generated using 4 different methods based on CIRS 062M measurements and commissioned in Raystation 2025

| | |
|---|---|
| Raw MD: raw mass density data | ESTRO SPR: following ESTRO consensus guide[1] |
| Raw SPR: raw SPR data | Schneider SPR: following Schneider's paper[2] |

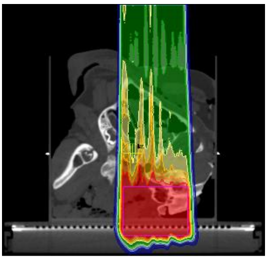
- Aim: To evaluate these curves by incorporating planar dose and water equivalent thickness (WET) measurements through the irradiation of animal tissue samples

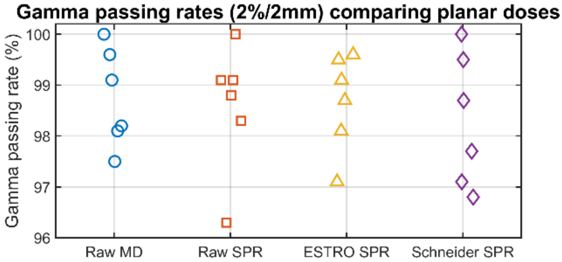
## Methods and Result:

- **Sample preparation**: a mixed tissue sample (pig head) and a separate tissue sample (pig fat, muscle and bone) were prepared and CT-scanned with Matrixx
- **Treatment planning**: Three plans were created and optimized to deliver uniform doses to cubic targets, so that Matrixx measures the proximal, middle and distal part of the SOBP

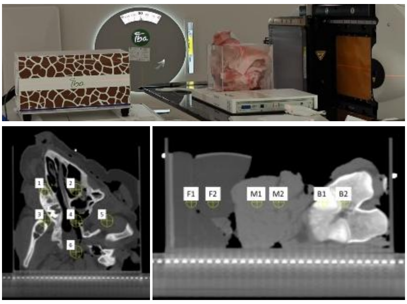


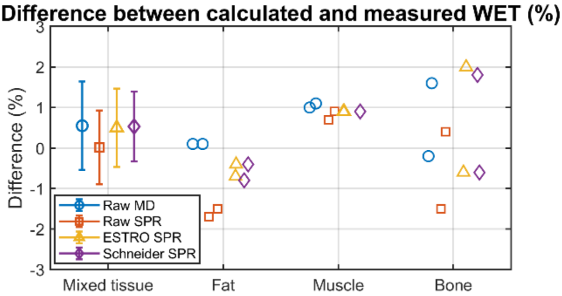

- **Planar dose assessment** (Gantry 0°): gamma passing rates (2%/2mm) all above 96.3%






- **WET assessment** (Gantry 90°): maximum WET difference 2.1%




## Conclusion:

- All four curves were validated for clinical use
- **Efficiency improved**: planar dose and WET assessments were both incorporated without remobilization of the sample

## References:


[1] Peters N, et al. Radiother Oncol. 2023;184:109675.

[2] Schneider U, et al. Phys Med Biol. 1996;41(1):111-24.