



# AN EXPERIMENTAL STUDY IN NUDE MICE ON THE ELECTROMAGNETIC DIAGNOSIS OF TUMORS



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## OBJECTIVES

✓ Electromagnetic detection of prostate cancer with the TRIMprob is a new promising technology. Preliminary data on the diagnostic accuracy of the TRIMprob at 465 MHz intensity, suggested a higher sensitivity and a slightly lower specificity compared PSA, free/total PSA ratio with better positive and negative predictive values (1-3). No experimental data are available.

Aim of our study was to:

- ✓ To measure signal intensity at 465, 930 and 1395 MHz in a experimental prostate and breast tumours
- ✓ To define the lowest tumour size identified by the TRIMprob
- ✓ To explore the possible relation between tumour size and signal intensity
- ✓ To investigate the effect of the site of tumour implantation on signal intensity

## MATERIALS AND METHODS

- ✓ 30 nude mice (15 ♂ and 15 ♀)
- ✓ Week -1
  - ✓ Animals received and stabilised in our animal facility for a week
  - ✓ Marked for further identification
- ✓ Week 0
  - ✓ All animals examined at baseline with the TRIMprob
- ✓ Week 1 to 3
  - ✓ 5 + 5 mice injected every week, for 3 weeks with PC3 (prostate) or CG5 (breast) cells
  - ✓ 10<sup>5</sup> cells suspended in HBSS (50 microL)
  - ✓ Injection site: left thigh (intramuscular), right shoulder (subcutaneous)
- ✓ Week 4
  - ✓ TRIMprob analysis performed in injected mice
  - ✓ Tumour size was measured in all animals
- ✓ Week 5
  - ✓ Animals were then sacrificed, all tumours were excised, fixed and processed for histology.

## SCANNING CONDITIONS AND TECHNIQUE

- ✓ Room tested for EM pollution
- ✓ Anaesthetised animals
- ✓ 2m distance between animal/probe and receiver
- ✓ All tests done in triplicate
- ✓ Single investigator

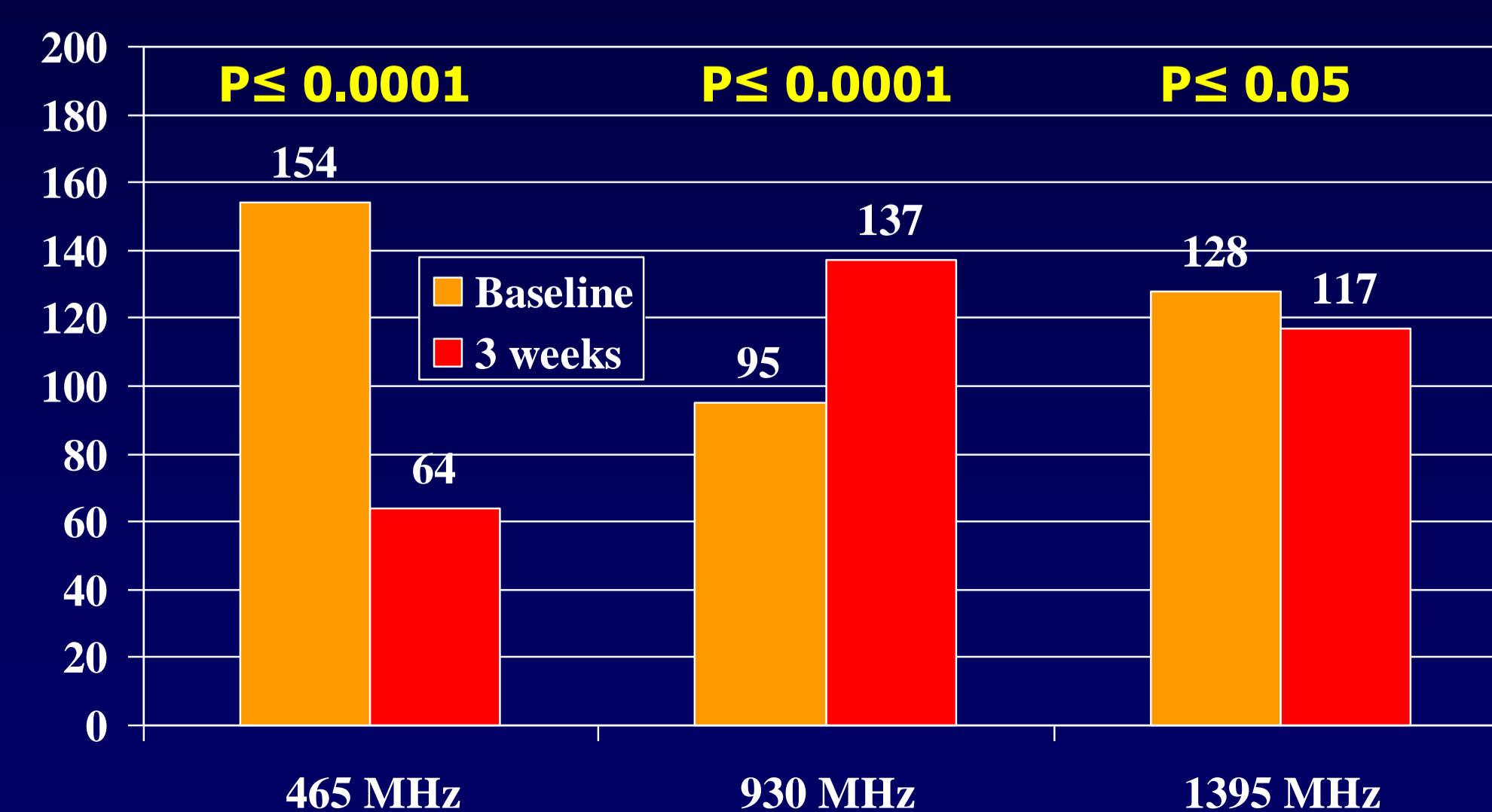


## RESULTS I: Baseline scanning: male vs female

	Sex	N	Mean*	SD	SE
465 MHz	Male	15	151.6	12.8	3.31
	Female	15	157.0	15.1	3.90

Independent-Sample T test, p ≤ n.s.

## RESULTS II: Intramuscular tumor implant signal intensity at 3 weeks

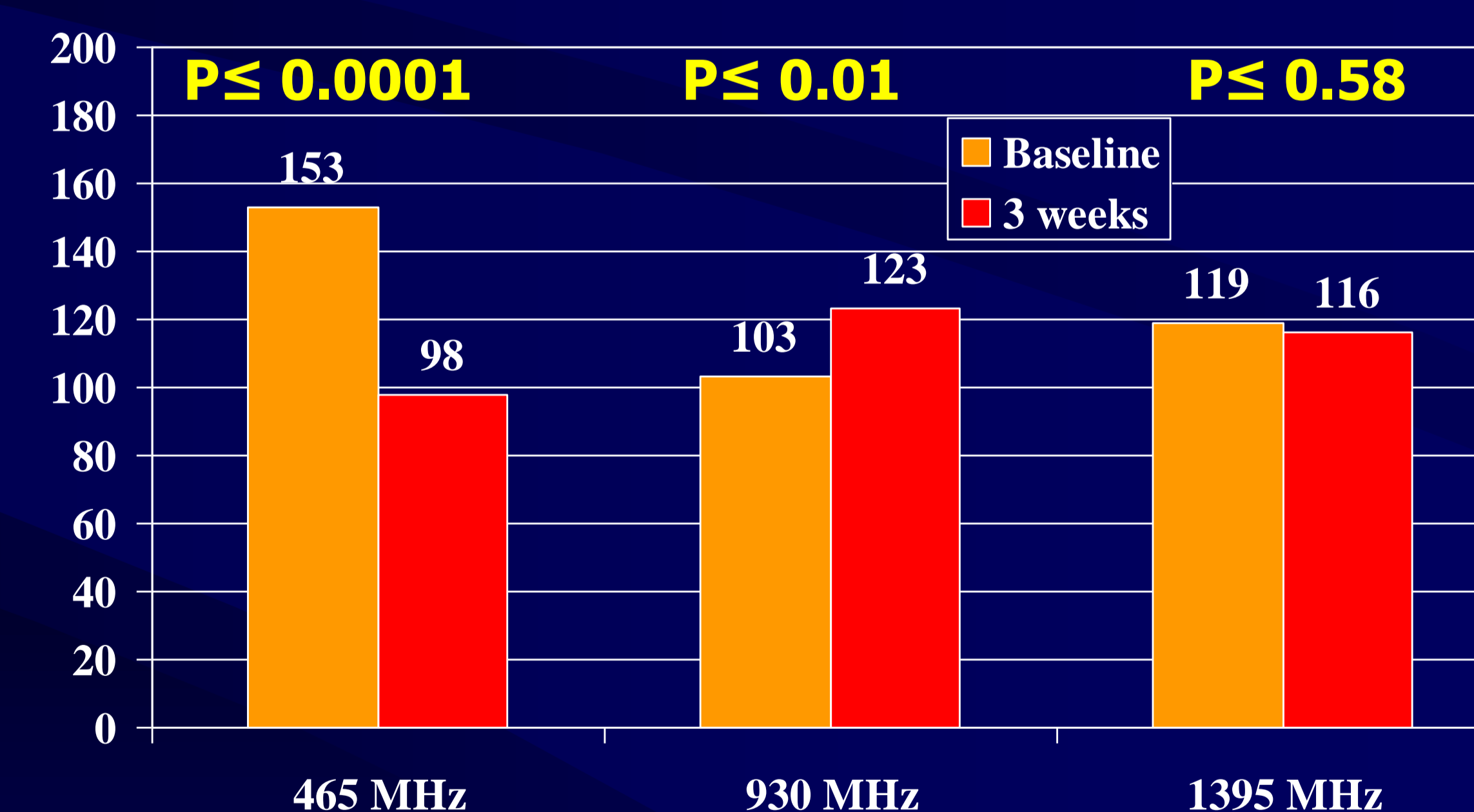


## RESULTS IV: Tumor weight

	PC3		CG5	
	i.m.	s.c.	i.m.	s.c.
Mean (mg)	914	211	906	276
Range	320-3323	62-799	387-1568	67-784

Independent-Sample T test, p ≤ n.s.

## RESULTS III: Subcutaneous tumour implant; Signal intensity at 3 weeks



## RESULTS V: All mice, correlation of signal intensity at 465 MHz and tumour weight

	465 MHz 3 weeks	Δ 465MHz Baseline-3 weeks
Tumor Weight	σ : - 0.682 p=0.005	σ : 0.63 p= 0.01

## CONCLUSIONS

- ✓ A significantly reduction of signal intensity at 465 MHz was observed in nude mice with prostate or breast cancer after tumour growth in the prostate cancer model.
- ✓ A significant correlation was found between tumour weight and
  - ✓ Change of signal intensity (465 MHz) from baseline
  - ✓ Signal intensity (465 MHz) at 3 weeks post-implant
- ✓ Data from our experimental tumour models confirm the diagnostic value of the TRIMprob for the electromagnetic diagnosis of cancerous tissue
- ✓ Confirmation studies are currently ongoing in prostate and breast cancer

## REFERENCES

- 1) Tubaro A, De Nunzio C, Trucchi A et al.: The electromagnetic detection of prostatic cancer: evaluation of diagnostic accuracy. Urology 2008 in press.
- 2) Bellerofonte C, Vedrucio C, Tombolino P et al. Non-Invasive Detection of Prostate Cancer by Electromagnetic Interaction. Eur. Urol. 47,29-37, 2005
- 3) Da Pozzo L, Scattoni V, Mazzoccoli B et al.: Tissue-resonance interaction method for the noninvasive diagnosis of prostate cancer: analysis of a multicentre clinical evaluation. BJU INT, 100, 1005-9, 2007