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# Prospective evaluation by Parametric Response Mapping (PRM) applied in MRI volumetric images of breast cancer


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**Mohammed EL ADOUI**

Mohammed.ELADOUI@umons.ac.be

**Stylianos Drisis**

Stylianos.drisis@bordet.ac.be

**Mohammed Benjelloun**

Mohamed.Benjelloun@umons.ac.be

## Purpose

The Parametric Response Mapping (PRM) is a new method used in the evaluation of patient's response to chemotherapy. This method measures the changes of quantitative MRI values of tumor tissues using a voxel-by-voxel approach. In this study we evaluate the utility of PRM to assess the response of breast cancer patients to chemotherapy.

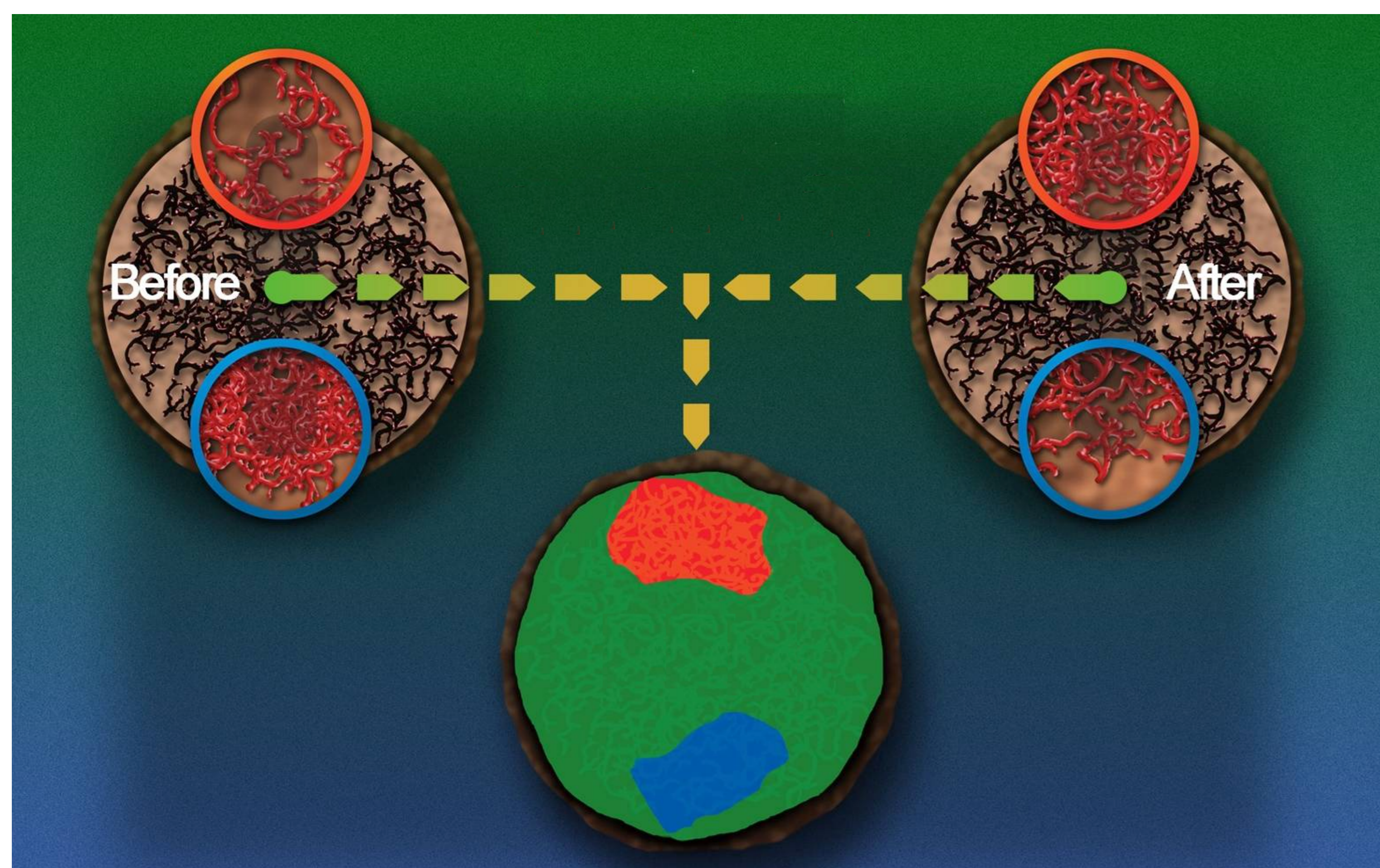


Figure 1 : Generation of parametric response mapping [1]

## Methods and materials

### I. Data

50 patients with breast cancer receiving neoadjuvant chemotherapy treatment, assessed in our institution by Magnetic Resonance Imaging (MRI), including different modalities:

#### 1. Dynamic contrast-enhanced : DCE-MRI

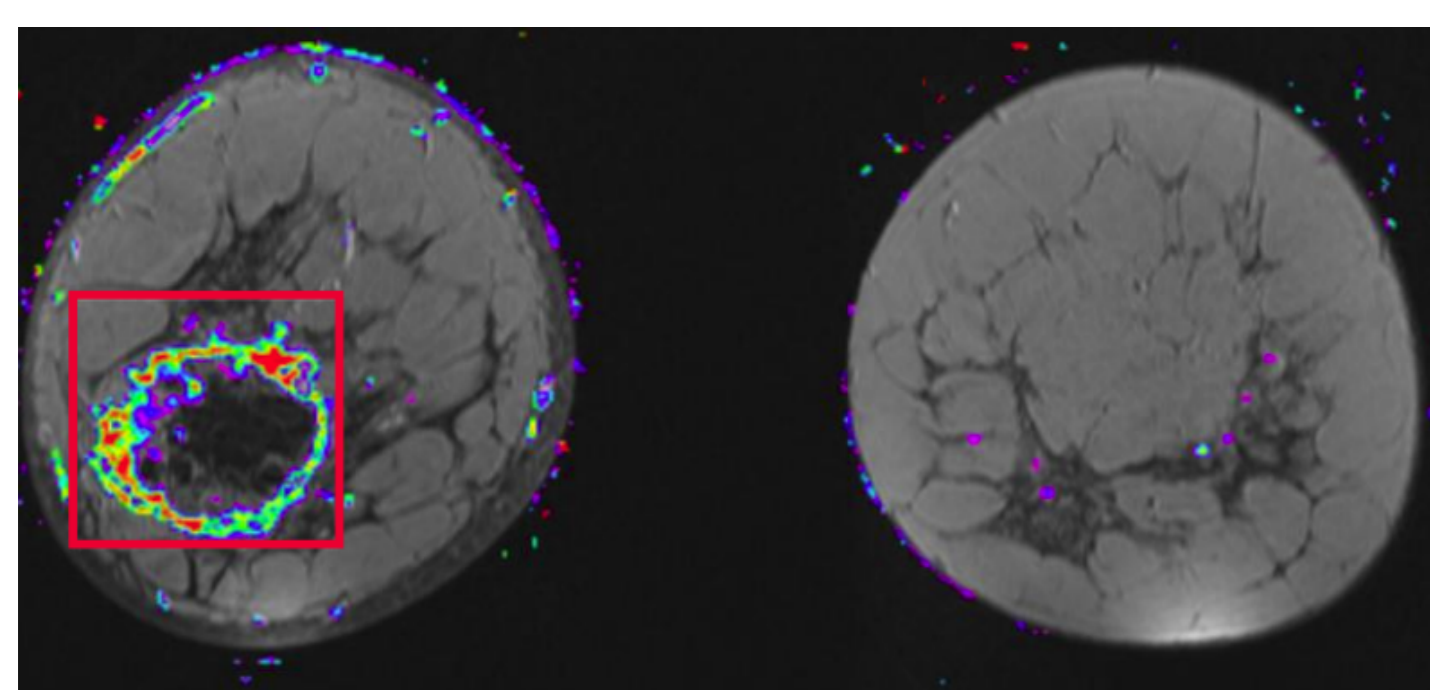


Figure 2 : DCE-MRI before treatment

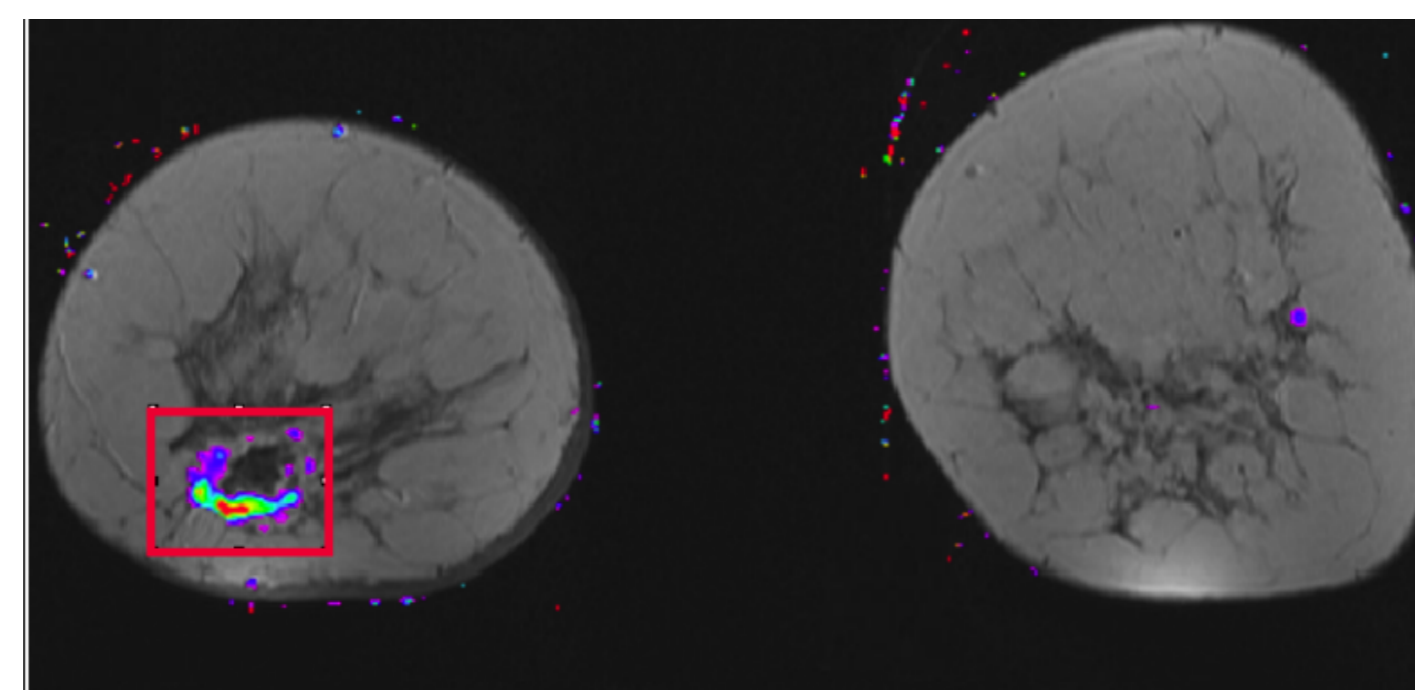


Figure 3 : DCE-MRI after treatment

#### 2. Diffusion weighted : DW-MRI

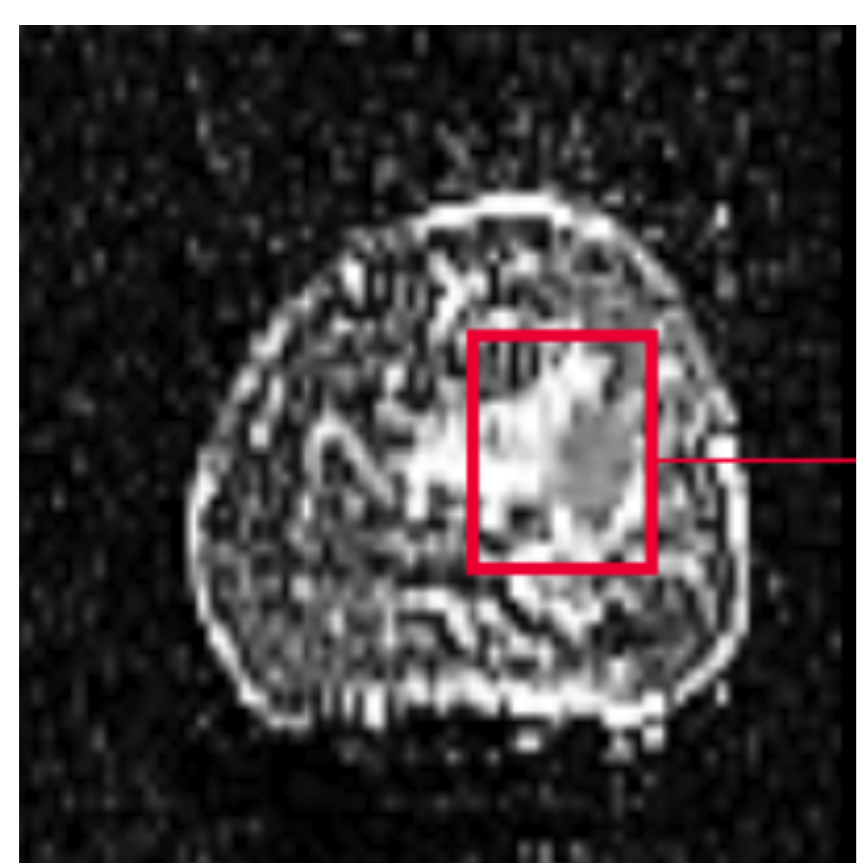


Figure 4 : DW-MRI before treatment

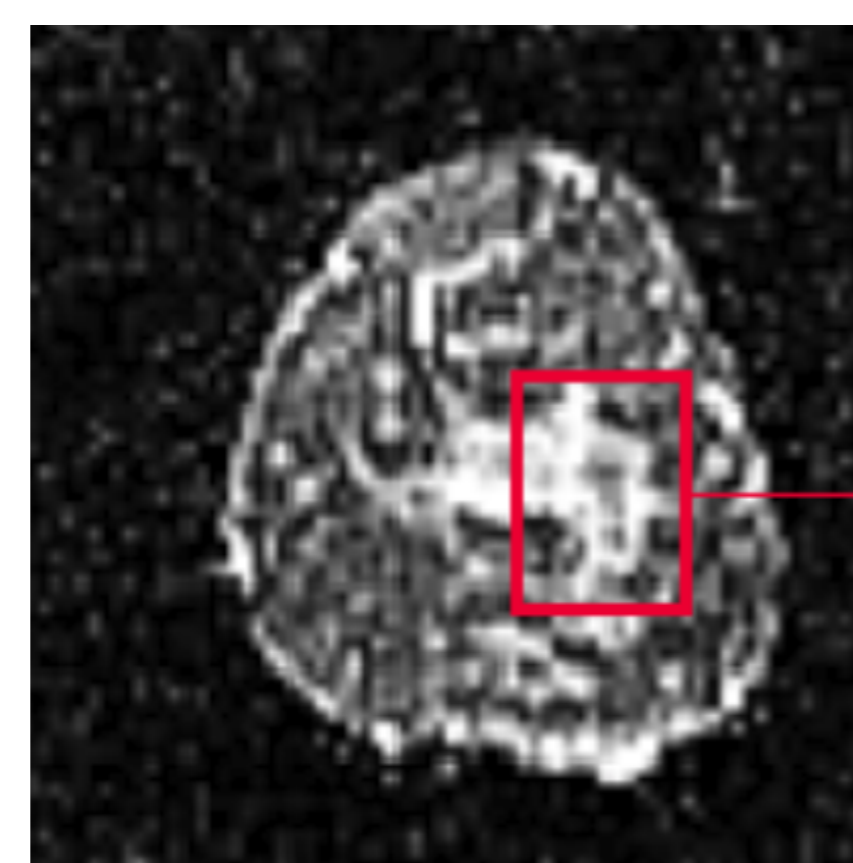


Figure 5 : DW-MRI after treatment

## Methods and materials

### II. Imaging techniques

#### 1. Semi-automatic Segmentation

Image segmentation is the process of partitioning an image into multiple segments. The goal of segmentation is to simplify the representation of our region of interest (tumor) to be easier to analyze. In our study, we segment volumetric images of breast semi-automatically.

#### 2. Rigid Registration

Image registration consists on the alignment of two (or more) images in order to compare or combine their respective information. Our study aims to align volumetric breast images before and after the treatment and detect the tumor changes to provide a parametric response map using multiple modalities (Figure 6).

## Results

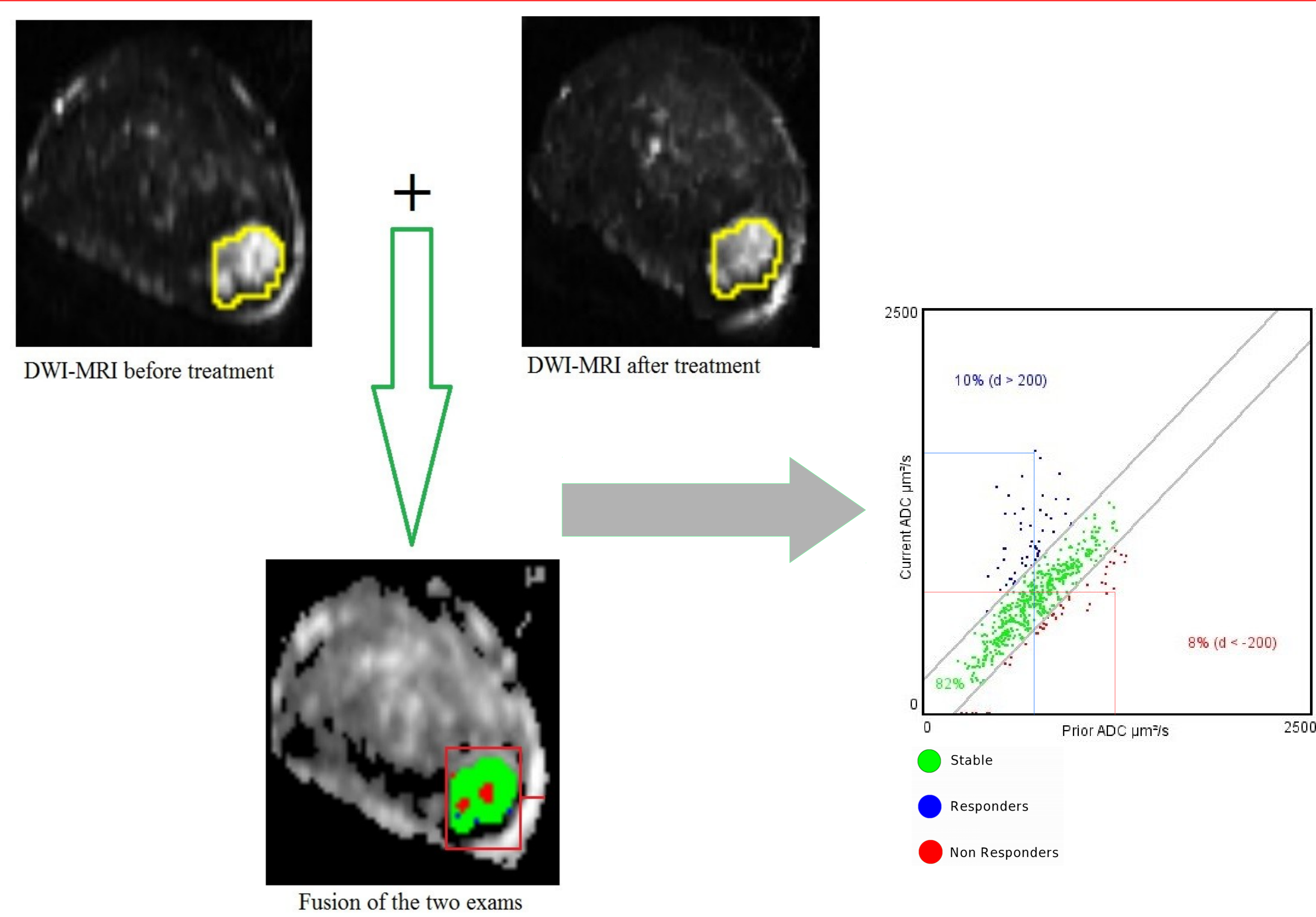


Figure 6 : The PRM Results

## Conclusion

The PRM techniques offers an efficient solution that consist on ignoring the traditional criteria of tumor size to predict the response to treatment. Moreover, it provides the possibility to detect the intratumoral response within a minimum number of treatment cycles, by providing a parametric response map.

## References

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