# ASSOCIATIONS BETWEEN RADIOLOGICAL PARAMETERS AND MOLECULAR PHENOTYPE IN HUMAN GROWTH HORMONE-SECRETING PITUITARY TUMORS: COULD THEY HELP IN PREDICTING THE APPROPIATE MEDICAL THERAPY?.

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## BACKGROUND

Acromegaly is caused by excessive growth hormone (GH) secretion from pituitary adenomas. Transphenoidal surgery is the first-choice treatment, but new drug therapies (e.g. somatostatin analogs, SSA) offer promising avenues for medical treatment. Complementary diagnostic tools may assist this strategy, helping to refine drug choice.

## OBJECTIVE

To investigate the associations between radiological features and molecular phenotype of pituitary tumors from acromegalic patients.

## MATERIAL AND METHODS

This observational study included 17 acromegaly patients (38.4±15.6 yrs; 64.7% women), diagnosed from 2007 to 2012 at the Endocrinology and Nutrition Unit of the Reina Sofia Hospital, in whom surgery, radiology and molecular phenotyping of the adenoma was carried out. .
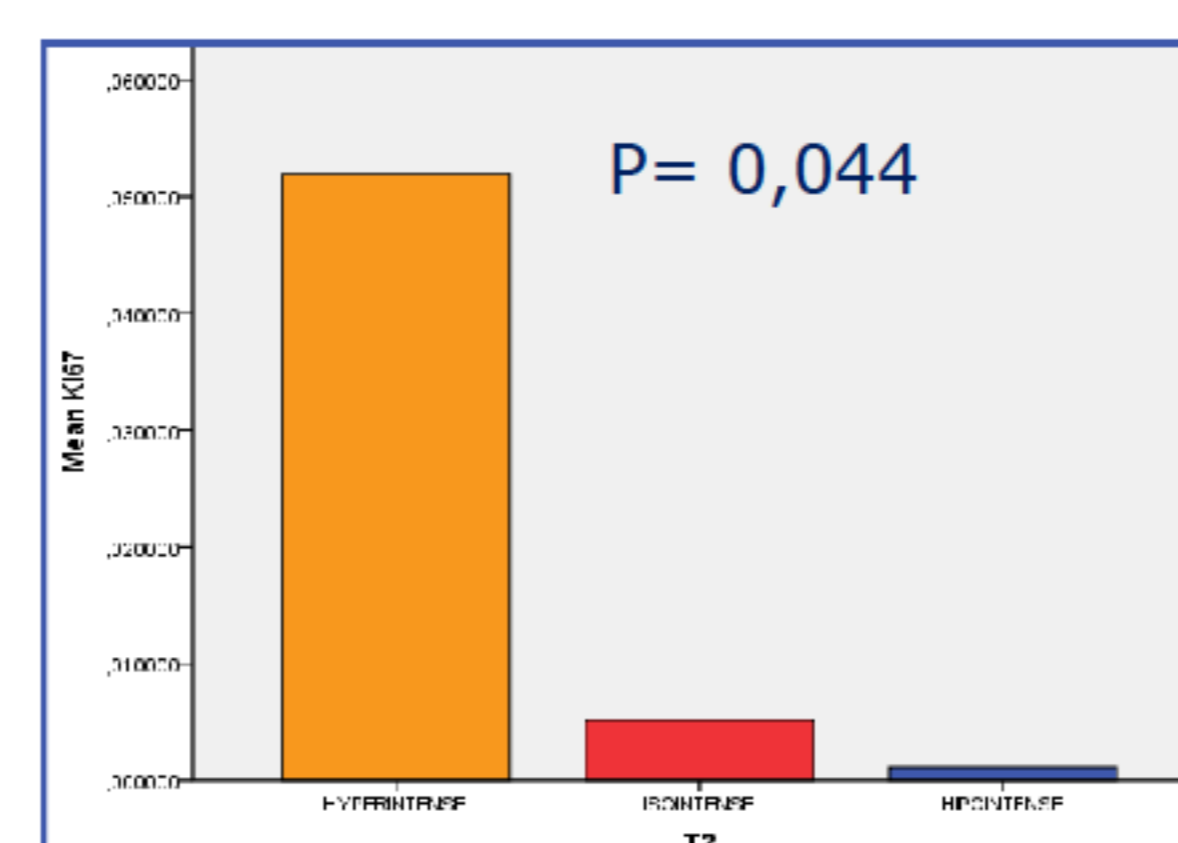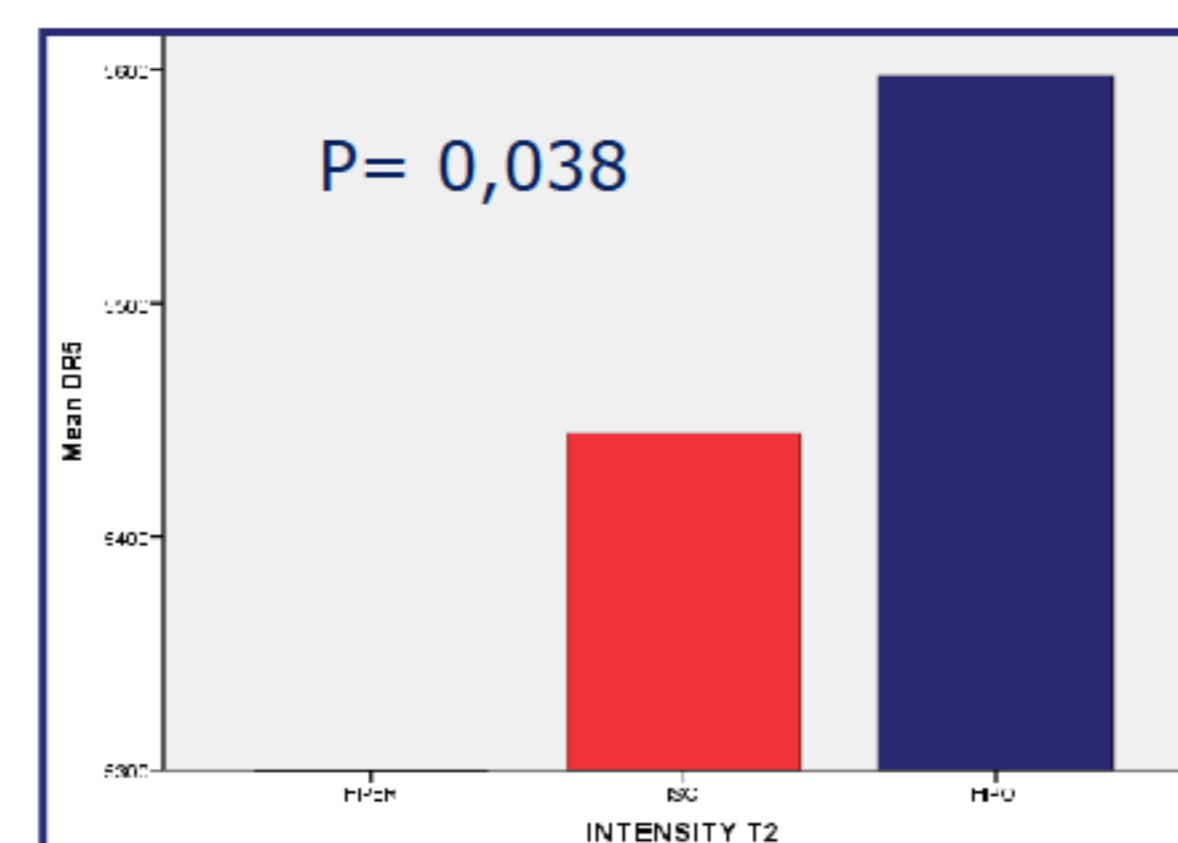
## RESULTS

17 patients

35% ♂ Mean year: 38,83 ± 17,28.
65% ♀ Mean year: 38,18 ± 15,41

MRI
- Microadenoma 5.4%
- Macroadenoma 94.6%
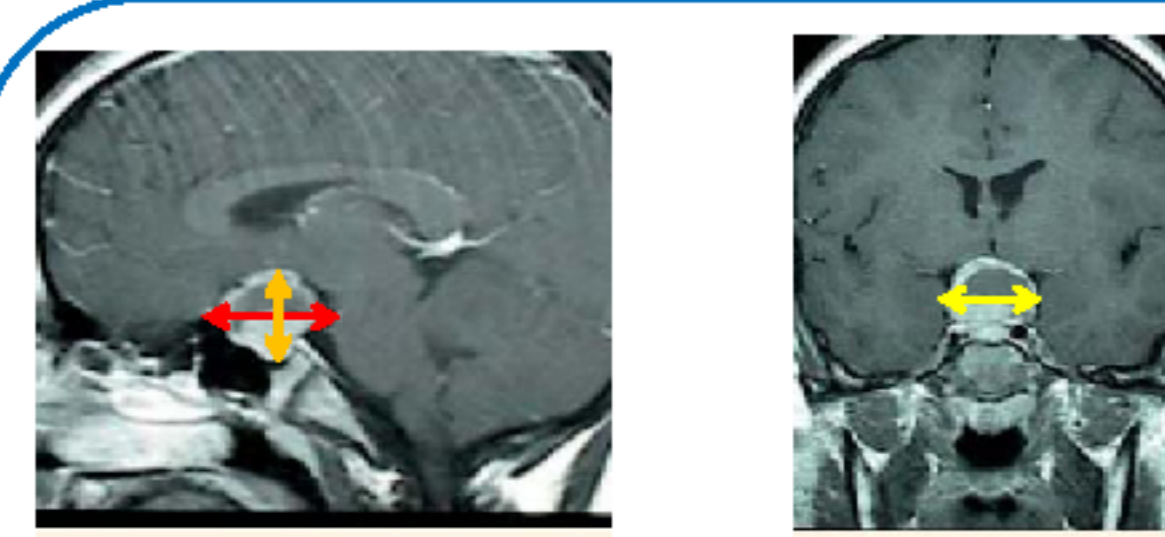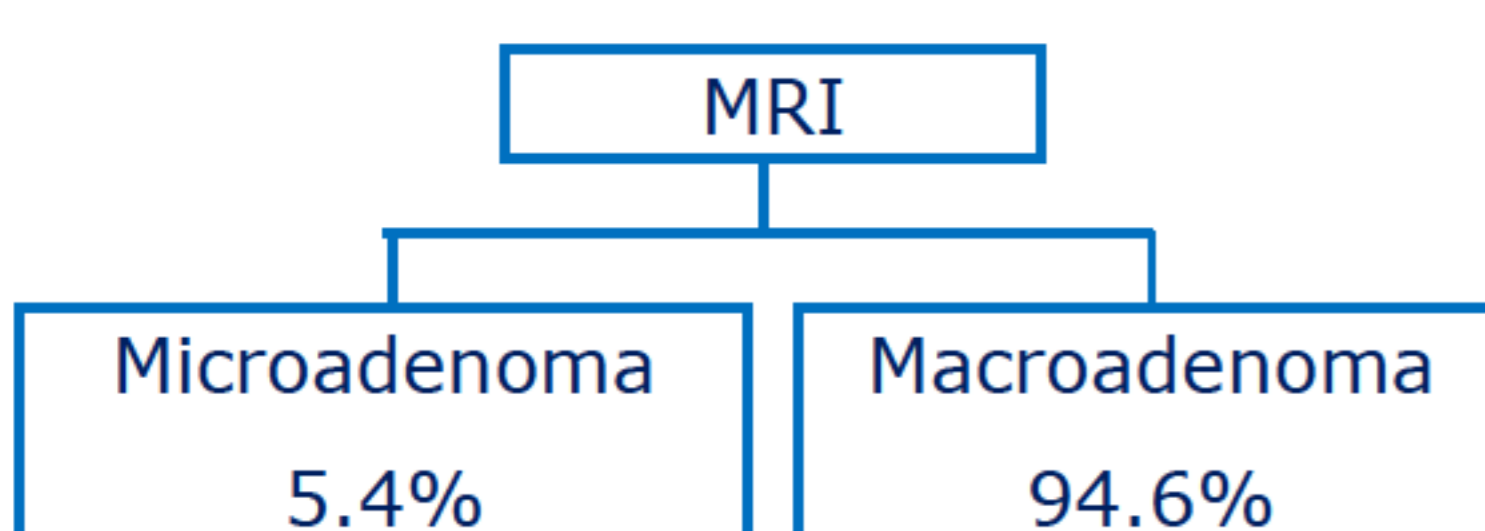


APD: Anterior-posterior: 18.3±6.6mm
IPD: Inferior-posterior: 18.8±6.7mm
LRD: Left-right diameter: 17.9±6.4 mm

P= 0,038

P= 0,044

| Signs at diagnostic | Percentage |
|---|---|
| Extrasellar growth | 73,3% |
| Suprasellar growth | 60,0% |
| Right sphenoid sinus invasion | 26,7% |
| Left sinus invasion | 20,0% |
| Both sinus invasion | 20,0% |

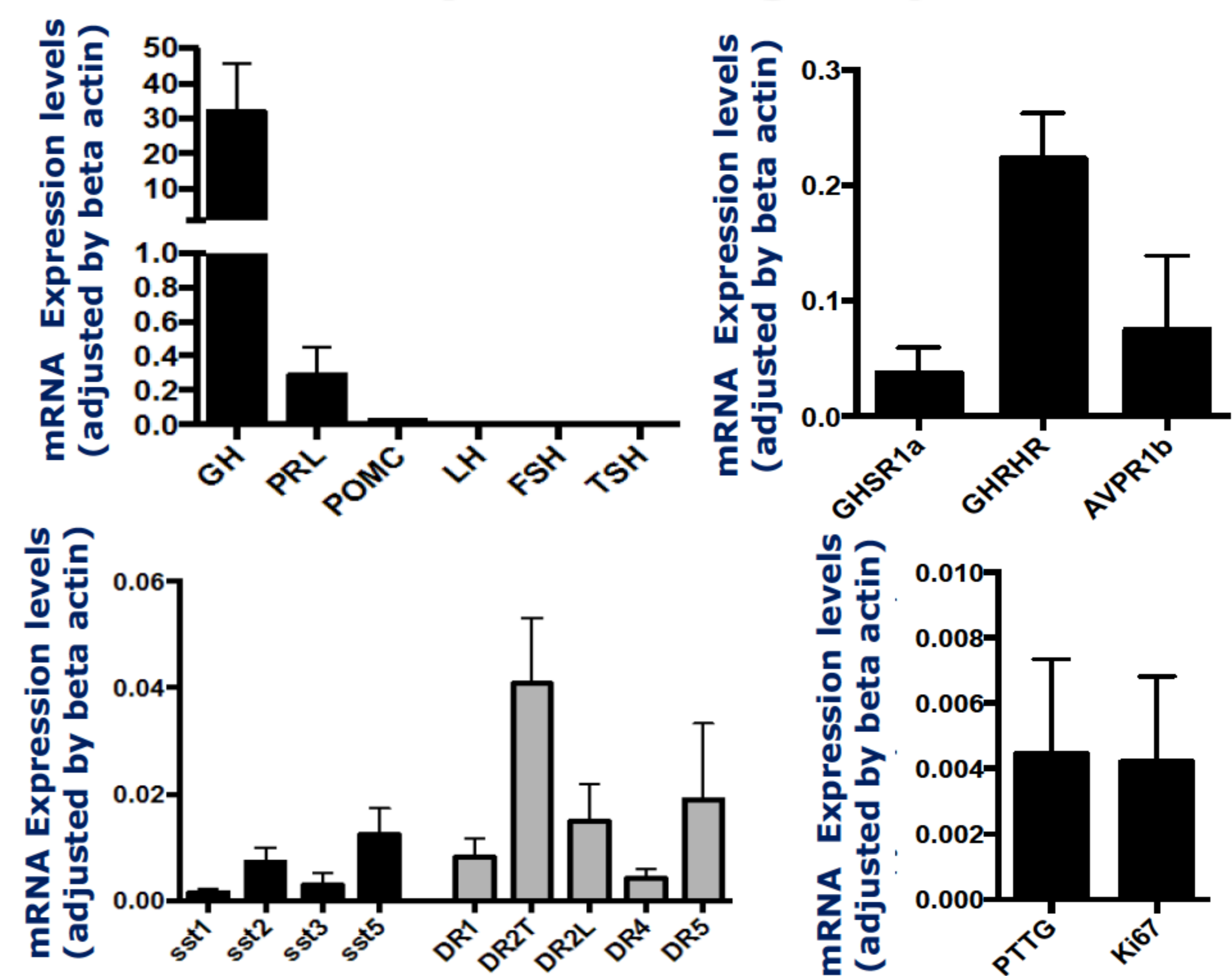| T2 | Isointense | Hypointense | P |
|---|---|---|---|
| IPD | 14.3±5.4 | 23.4±5.3 | p=0.009 |
| LRD | 14.6±7.2 | 21.2±4.5 | p=0.035 |
| Total volume | 2.2±3.1 | 4.5±2.6 | p=0.025 |
| Knosp index | 1.1±1.5 | 2.9±1.2 | p=0.036 |

### Molecular study of the surgical piece



**Figure.** Expression level (mRNA) of different hormones, receptors and tumoral markers in the surgical pieces of acromegaly patients (n=19) measured by quantitative real-time PCR. Data represent average ± SEM adjusted by the expression level of a housekeeping gene (beta-actin).

### Direct correlation

IPD – DR5 [Rho=0,707]
- SST3 [Rho=0,549]

DR5– APD [Rho=0,735]

Volume - SST3 [Rho= 0,535]
- DR5 [Rho=0,736]

KNOSP – APD [Rho= 0.826 ]
- IPD [Rho= 0,846 ]
- LRD [Rho= 0.761 ]
- Volume [Rho= 0.885 ]
- SST3 [Rho= 0.707 ]
- Ki67 [Rho= 0.721 ]

## CONCLUSION

Our results reveal significant correlations among key pre-surgical radiological parameters and specific molecular phenotypic features of pharmacological relevance in GH-producing adenomas. Future studies should explore the molecular basis of these findings and their potential value in helping to select the appropriate medical therapy for these patients.

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