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## M<sub>2</sub> AND M<sub>3</sub> MUSCARINIC RECEPTOR EXPRESSION IN BLADDER TUMOR



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### INTRODUCTION AND OBJECTIVES

Bladder cancer is one of the most common urogenital cancers of Western society. Transitional cell carcinoma is a heterogeneous cancer type, which constitutes 90% of all bladder cancers. Urothelial cells are continuously in relation with several signal molecules and neurotransmitters. One of these, muscarinic acetyl choline receptors, are expressed on both urothelial cells and detrusor muscle and play a great role in human bladder physiology. Specifically M2 and M3 type receptors are the most common receptors of bladder. M2 receptors are specially found on umbrella cells on the mucosa layer of bladder and almost up to three times more frequent than M3 receptors. Some of the recent studies show the importance and role of muscarinic receptors on some types of disease. In this study muscarinic receptor expression, namely M2 and M3 subtypes of muscarinic receptors were analyzed on bladder tumor samples.

### METHODS

In order to have a strong evidence of M2 and M3 subtypes in bladder tumors, the samples were analyzed both with Western blot technique and with immunohistochemistry. Bladder tumor samples, which are collected by transurethral resection of the bladder, are homogenized, centrifuged and preserved at -80C. Protein component was analyzed via Lowry method.  $p < 0.05$  data were accepted as statistically significant. The samples also were analyzed by pathologists with immunohistochemistry technique for M2 and M3 muscarinic receptor expression.

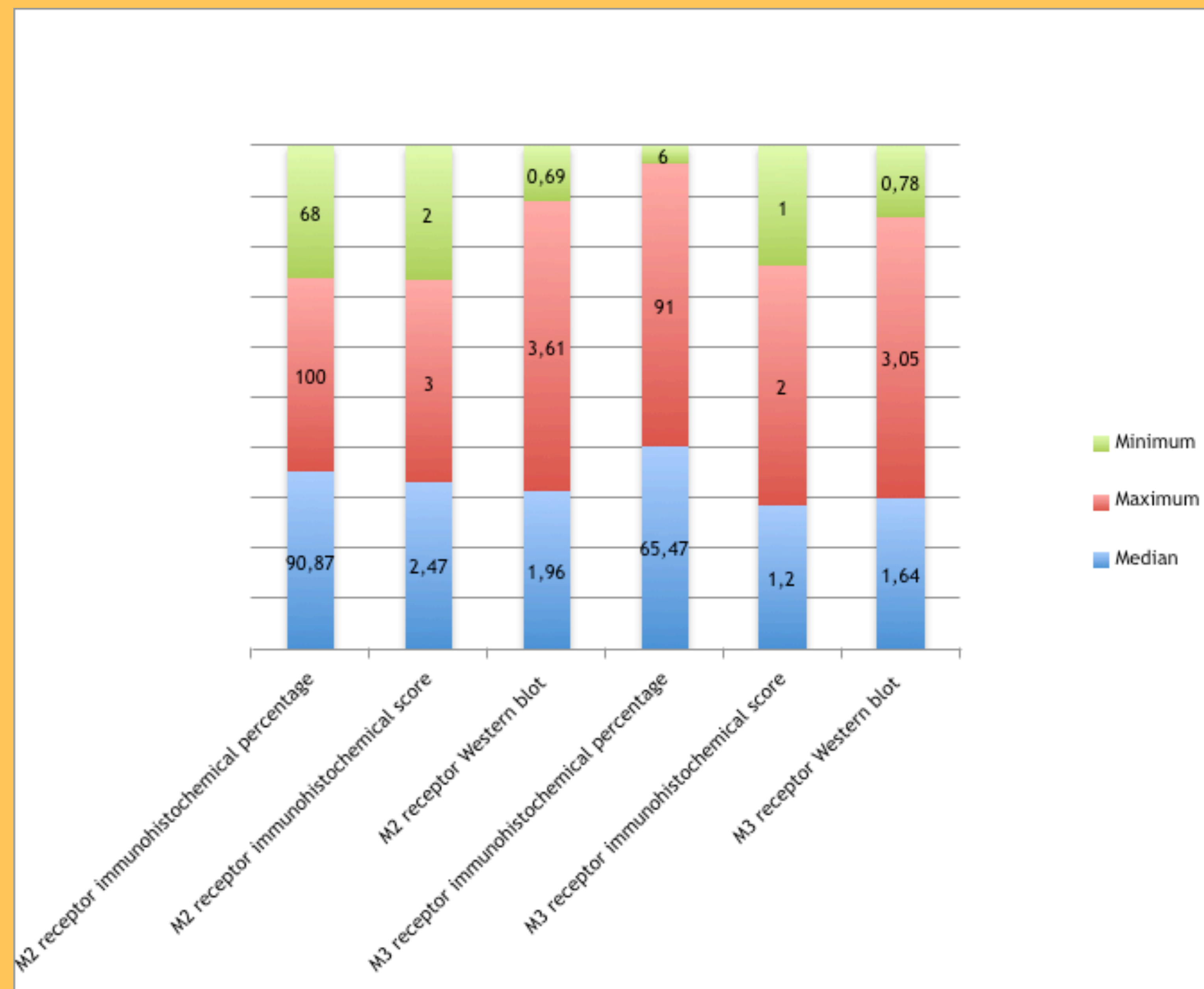


Figure 3. Summary of receptor analysis results

### RESULTS

Data of 45 patients were analyzed. Statistical analyses show that patients with pathological T2 stage and with progressed disease during follow-up have greater M2 receptor value which is statistically significant. There was no relation between M3 muscarinic receptor level and tumor grade/stage or progression rate. These results were not dependent by patient age or lower urinary tract symptoms. Progression rate was found higher in patients with higher M2 muscarinic receptor levels on bladder tissue samples.

### CONCLUSION

M2 and M3 muscarinic receptors not only play a great role on bladder functions but also may be important for bladder cancer pathophysiology though, their role in the development of bladder cancer has not been defined yet. This current trial may indicate M2 receptors to be a potential treatment target for bladder cancer.