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# EXPRESSION PATTERN OF THE MRPS18 FAMILY PROTEINS IN CHORDOMA

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Chordomas are rare tumors of the axial skeleton that arise from the notochord; they are observed usually at the base of the skull and rarer along the spine. The diagnosis of chordoma is made based on results of an immunohistochemical analysis (by staining of the S100 protein) [1, 2]. While chordomas are resistant to conventional chemotherapy, skull base chordomas are not amenable to complete resection, due to the high-risk levels because of the proximity to the optic system, carotid artery, and brainstem [3]. That is why the identification of the new diagnostic and/or prognostic markers is an important task.

We have shown recently, that genes of the mitochondrial ribosomal protein S18 (MRPS18) family are differentially expressed in gliomas [4]. We have shown earlier that MRPS18-2 interacts with the retinoblastoma-associated protein (RB) and can sequester the latter to the cytoplasm [5]. Moreover, MRPS18-2 competes with E2F1 for the RB binding, thus, lifting the RB-depended block on $G_1$/S transition [6]. The MRPS18-2 oncoprotein is expressed at higher levels in cancerous cells compared to their normal counterpart [5]. Of note, all proteins of this family — MRPS18-1-3 can bind RB, thought with the different affinity. Hence, all of these proteins might be involved in tumor development.

***Aim***. To investigate the peculiarities of the expression pattern of the MRPS18 family genes in chordoma to better understand their role in cancerogenesis.

***Methods***. 15 specimens of chordoma of the base of the skull and 5 samples of the spine localization were studied retrospectively. The specific antibodies against MRPS18-1, MRPS18-2, MRPS18-3, and RB was used for an immunohistochemical analysis. All cases were stained in parallel with appropriate negative control.

***Results and Discussion***. We found that MRPS18 family proteins are differentially expressed in chordoma tissues (Figure). MRPS18-1 showed the strongest signal in all tumor samples. The lowest level of the signal intensity was recorded for the MRPS18-3 protein.

The RB protein was quite low in cancerous cells. Noteworthy, in several samples (for example, 105 and 435, Figure, the left column) the RB signal was detected in cytoplasm of tumor cells. Importantly, in these samples the strong staining for MRPS18-2 was observed a well (the third column from the left).

This phenomenon is similar to that what we have observed earlier in cells concurrently expressing both, MRPS18-2 and RB at very high levels [5]. The fine mechanism of sequestering of RB in cytoplasm of cancer cells should be further elucidated.

***Conclusion***. The MRPS18 family proteins showed differential expression pattern in chordoma cancerous cells. Moreover, the RB protein was detected in the cytoplasm of tumor cells in a few cases. These preliminary results should lead to a larger work on a role of RB-MRPS18 family proteins interaction for chordoma development.

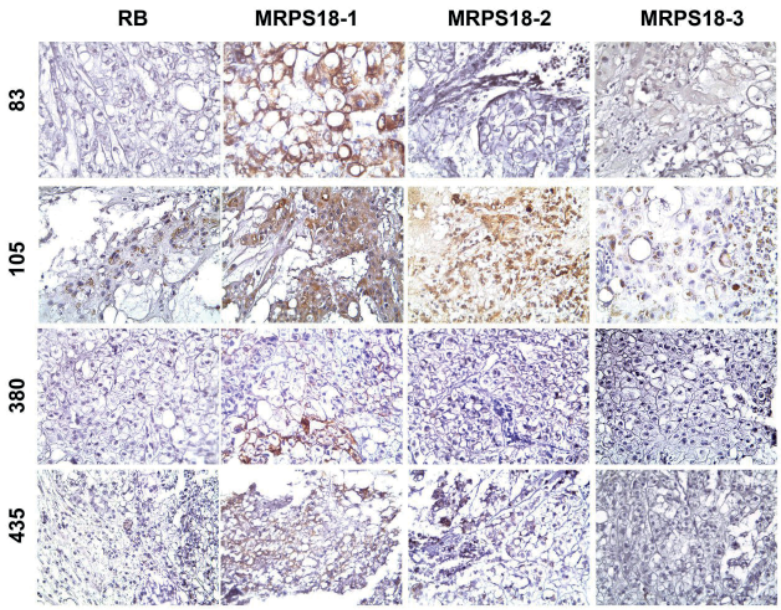


*Fig.* **Immunohistochemistry on chordoma tissue samples**
Tissues were stained with the specific rabbit antibodies against MRPS18-1-3, RB. Magnification is ×400

***Key words:*** chordoma, MRPS18 family genes, proteins MRPS18-1, MRPS18-2 and MRPS18-3, RB gene, RB protein.

*Authors contribution.* AVS and LMK performed the immunohistochemical analysis; AVS, LMK and EVK analyzed the data; TAM performed diagnostics; EVK supervised and conceived the study.

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