Mouse double minute 2 homolog (MDM2) also known as E3 ubiquitin-protein ligase Mdm2 is a protein that in humans is encoded by the MDM2 gene.

Mdm2 is an important negative regulator of the p53 tumor suppressor. Mdm2 protein functions both as an E3 ubiquitin ligase that recognizes the N-terminal trans-activation domain (TAD) of the p53 tumor suppressor and an inhibitor of p53 transcriptional activation.



Benign fibro-osseous lesions (BFOLs) are a diverse group of lesions showing considerable degree of overlap with low grade osteosarcoma (LGOS). Further, de-differentiated osteosarcoma (DOS) is usually indistinguishable from conventional high-grade OS (COS) if LGOS foci are not identified. Thus, there is a need for adjunctive immunohistochemical markers to differentiate OS from benign FOLs as well as DOS from COS. A study of Kaur et al. evaluated the role of immunohistochemical expression of MDM2, CDK4, parafibromin, BCL-2 and Galectin-1 (Gal-1) in accurate characterization of benign FOLs and in differentiating them from OS. They retrieved 101 tissue samples which were diagnosed as osteosarcoma (OS) /ossifying fibroma (OF) / fibrous dysplasia (FD) or fibrous hyperplasia (FH) and examined their immunohistochemical staining pattern with the aforementioned antibodies. MDM2 showed 100% specificity for diagnosing OS. CDK4 and Gal-1 showed linear increase in immunoexpression from benign BFOLs to OS. BCL-2 showed equivocal immunopositivity in OF and OS, but the positivity was higher than that observed in FD. The highest immunoexpression for parafibromin was seen in FD followed by OF and OS cases. Thus, MDM2 is most specific, and Gal-1 is most sensitive of all the markers studied in differentiating OS from benign mimics. Combination of these two markers can be used as an adjunct to conventional imaging and microscopy in accurate characterization of these lesions. Further MDM2 overexpression can differentiate DOS and COS.¹¹.

mdm2

1)

Kaur H, Kala S, Sood A, Mridha AR, Kakkar A, Yadav R, Mishra S, Mishra D. Role of MDM2, CDK4, BCL2, Parafibromin and Galectin 1 in Differentiating Osteosarcoma from its Benign Fibro-osseous Lesions. Head Neck Pathol. 2022 Feb 26. doi: 10.1007/s12105-022-01434-9. Epub ahead of print. PMID: 35220546.

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