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New Bone and Soft Tissue Tumours: New Treatment Options

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Bone and soft tissue sarcomas are treated with chemotherapy, surgical excision with a safe margin, and radiation. Although good results have been reported in patients with non-metastatic sarcomas, patients with metastatic or recurring sarcomas continue to have poor outcomes. To battle metastatic or reoccurring sarcomas, new medications or adjustments to existing treatments are required. This special issue included new research and reviews on therapeutic targets, anticancer medicines, immunotherapy, and treatment for patients with bone and soft tissue sarcomas. This special issue included several papers and reviews on aberrant gene expression in bone and soft tissue sarcomas. When Simpson et al. analysed gene expression in canine osteosarcomas and non-tumor tissue, they discovered 1281 significantly differently expressed genes (839 lower and 442 greater gene expression), with qRT-PCR and immunohistochemistry verifying a selection of them. Greither et al. also investigated the role of miR-155-5p and miR-203a-3p expression in soft tissue sarcoma patients' prognosis. In this study, higher miR-155-5p expression was linked to a higher tumour stage, while low miR-203a-3p expression and high miR-155-5p expression were both linked to poor survival in patients with soft tissue sarcomas. Furthermore, Fellenberg et al. emphasised the importance of microRNAs as a therapy target for osteosarcoma. The suppression of miR-127-3p and miR-376a-3p in osteosarcoma cell lines and tissues was revealed in this study, and transfection with miR-127-3p and miR-376a-3p mimics significantly inhibited osteosarcoma cell proliferation and colony formation. Cells transfected with miR-127-3p and miR-376a-3p showed a significant reduction in tumour volume when compared to wildtype cells. These findings suggest that these miRNAs could be utilised as targets for the development of new osteosarcoma treatments. Gene mutations, molecular biology, therapeutic targets, and current clinical trials in osteosarcoma and epithelioid sarcoma have all been well reviewed in Czarnecka et alreviews.

Patients with metastatic lesions have poor clinical outcomes, and these sarcomas are known for having a high risk of metastasis and recurrence. The Hippo/YAP signalling system has been associated to tumour growth, tissue regeneration, immunity, stem cell differentiation, and malignancies, among other physiological processes and illnesses. Morice et al. examined the Hippo pathway's role in the development of juvenile sarcomas in their review paper. In their review, the researchers looked into the mechanisms of the Hippo/YAP signalling pathway's connection to tumour proliferation, angiogenesis, epithelial-to-mesenchymal transition, migration, and invasion. A number of medications targeting the Hippo/YAP pathway have also been released. To assess its utility as a therapeutic target in sarcoma patients, greater study into the mechanism and therapeutic targets of the Hippo/YAP pathway in sarcoma cells is required.In some cancer stem cells, autophagy, which allows cellular components to be degraded and recycled, is increased. Researchers studied the relationship between cancer stem cells (CSCs) and autophagy in osteosarcoma. According to the researchers, autophagy is more efficient in osteosarcoma CSC-enriched populations than in parental cell lines. Autophagy is a crucial mechanism for CSC survival in osteosarcoma, according to their results. Choosing the optimal treatment for sarcoma is tough, despite the fact that the number of available neoadjuvant approaches is constantly expanding. Rapamycin and gemcitabine combination therapy was compared to rapamycin and gemcitabine monotherapy by Ando et al. Combination therapy with rapamycin and gemcitabine was more effective than treatment with a single medication in both in vitro and in vivo trials.