

Researchers discover a treatment against an aggressive childhood cancer

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A study made by IDIBELL researchers shows that glucose metabolism inhibition with 2-deoxyglucose (2-DG) induces cell death in a type of childhood sarcoma: alveolar rhabdomyosarcoma. The results have been published in the journal *Cancer Research*.

This molecule is very similar to the one used widely in positron emission tomography (PET), an imaging technique used to diagnose tumours by their glucose consumption rate. This suggests that it might be immediately repositioned as a therapy to treat an often fatal [childhood cancer](#).

Rhabdomyosarcoma is the most common soft tissue tumour in children and adolescence, accounting for 4-5% of paediatric tumours. It occurs in two forms: embryonal rhabdomyosarcoma, the most frequent and less aggressive; and alveolar rhabdomyosarcoma, with worse prognosis.

The most widely used treatment for the latter type of sarcoma is surgery. Chemotherapy treatments are not effective and now the survival rate five years after diagnosis is 70%, which indicates that it is necessary to develop more effective treatments.

New therapeutic strategies

In this regard, in recent years it has increased interest in studying tumour metabolism as a potential [therapeutic target](#). Several [metabolic pathways](#)

have different functions in [tumour cells](#) and in healthy cells. Specifically, glycolysis (glucose oxidation for energy) is increased in some tumour cells. This makes them particularly sensitive to inhibitors of glycolysis such as 2-deoxyglucose.

The study, coordinated by the head of the group of Cell Death Regulation, Cristina Muñoz-Pinedo, and the head of the group of Sarcomas, Oscar Martínez-Tirado shows that "in vitro" this molecule inhibits the metabolism of glucose needed by tumour cells, and causing their death.

According to researcher Cristina Muñoz-Pinedo this molecule "slows the growth of tumor cells, causes their death and a percentage of them suffer a terminal differentiation, and present the appearance of healthy muscle cells."

This molecule is also very similar to that used in PET imaging techniques used to diagnose tumours with high metabolism of glucose. Because of this and the fact that there are ongoing clinical trials with other tumours, shows that, at high doses, this molecule has low toxicity and it would be relatively easy that it could be used in alveolar rhabdomyosarcoma treatment.

Muñoz-Pinedo added that "knowing the mechanism that causes cell death of tumor cells, will be useful, in the future, to find more personalized treatments."

More information: Ramírez-Peinado S., Alcázar-Limones F., Lagares-Tena L., El Mjijad N., Caro-Maldonado A., Tirado O.M. and Muñoz-Pinedo C. Cancer Research [doi:10.1158/0008-5472.CAN-11-0759](https://doi.org/10.1158/0008-5472.CAN-11-0759)

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