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Scientists uncover strategy able to dramatically reduce chemotherapy's side effects

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Researchers in Leuven (VIB/KU Leuven) have confirmed their hypothesis that normalizing blood vessels by blocking oxygen sensor PHD2 would make chemotherapy more effective. They also demonstrated for the first time that this strategy would reduce the harmful side effects of chemotherapy on healthy organs.

The effectiveness of chemotherapy is first and foremost limited by the difficulties of delivering the anticancer drugs to the actual tumor. Tumors are characterized by abnormally shaped blood vessels – they are irregular in shape, have weak textures and easily tear. These leaking blood vessels prevent anticancer drugs from reaching tumor cells while promoting metastasis. Secondly, chemotherapy can have seriously harmful effects on healthy organs, leading even to heart and kidney failure.

Earlier research at Max Mazzone's lab had already shown that reduced activity of the oxygen sensor PHD2 under hypoxic conditions resulted in a more streamlined vasculature. In this new study, and using mouse models, Rodrigo Leite de Oliveira, Sofie Deschoemaker and Max Mazzone prove their earlier hypothesis that streamlining blood flow by inhibiting PHD2 can render cancer treatments more effective. Firstly, the better formed blood vessels ensure that the anticancer drugs are distributed throughout the tumor, thus increasing their impact. They also allow for smaller doses – a significant advantage when administering

toxic drugs. The researchers further proved that inhibiting PHD2 results in the production of anti-oxidant enzymes able to neutralize the harmful side effects of chemotherapy.

The study is promising: chemotherapy combined with specific PHD2 inhibitors would make chemotherapy more effective while reducing the harmful side effects that place such a heavy burden on patients. Unfortunately, there are no specific PHD2 inhibitors available right now, so we have a long way to go before patients will be able to benefit from this discovery.

Provided by VIB (the Flanders Institute for Biotechnology)