# Valrubicin-loaded immunoliposomes: A new technology to fight hematological cancer

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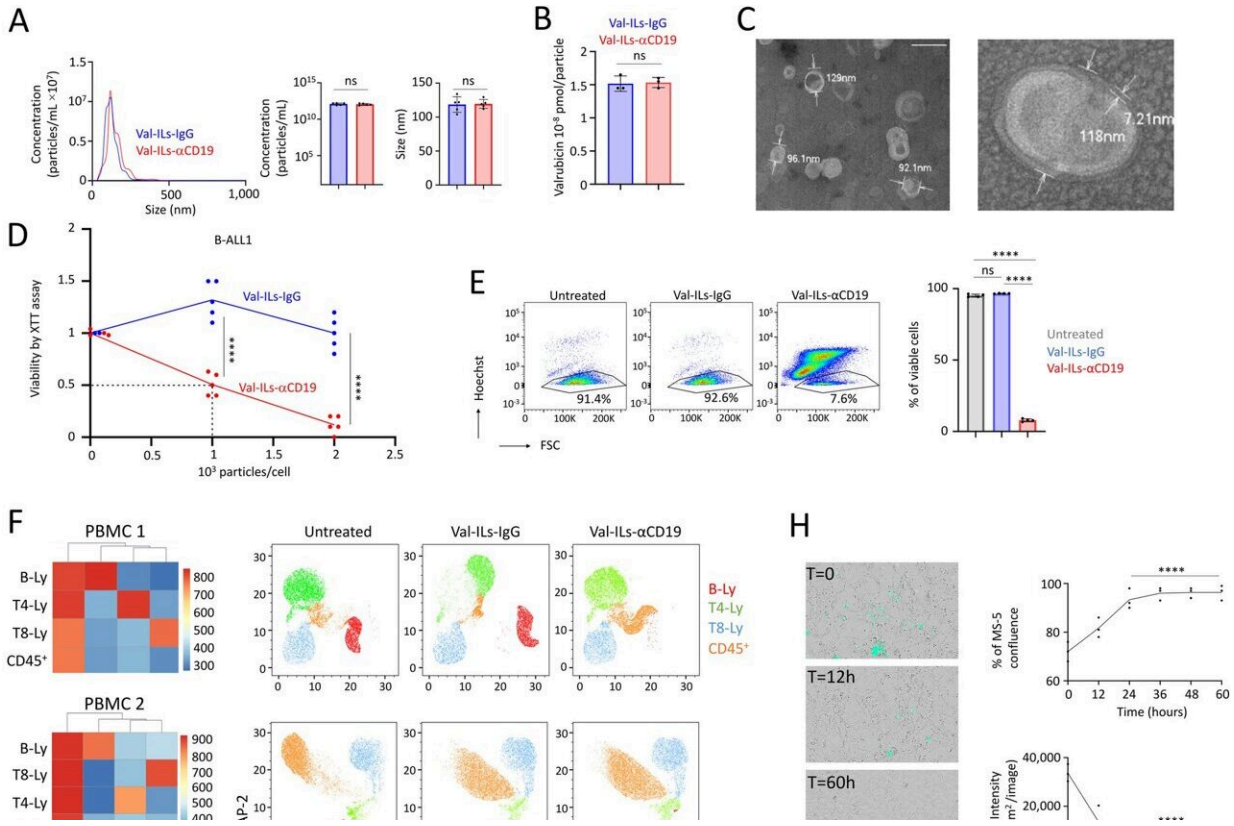


Val-ILs-αCD19 efficiently induces the death of human CD19$^+$ cells. Credit: *Cell Death & Disease* (2024). DOI: 10.1038/s41419-024-06715-5

Valrubicin, a lipophilic chemical molecule similar to daunorubicin, has primarily been used in the treatment of bladder cancer. An article recently published in *Cell Death & Disease* describes the repurposing of this molecule for the creation of valrubicin-loaded immunoliposomes (Val-ILs).

Due to its lipophilic nature, valrubicin easily integrates into the lipid composition of the nanoparticles, allowing it to target immunosuppressive cells effectively once injected into the body, thus treating cancers efficiently.

When injected into the bloodstream, Val-ILs quickly reach the bone marrow and spleen, areas often affected by cancer. In tests with mice transplanted with human leukemia cells (B-cell acute lymphoblastic leukemia, T-cell acute lymphoblastic leukemia, or acute myeloid leukemia), Val-ILs targeted cancer cells effectively. Only a small amount of valrubicin was needed to kill these cancer cells, showing that this method could efficiently treat leukemia.

Val-ILs also demonstrated an ability to protect healthy stem cells during stem cell transplants, reducing the risk of contamination by cancer cells. This is a significant advantage for clinical use for bone marrow transplantation.

In additional experiments with lymphoma cells in mice, Val-ILs targeted immune-suppressing cells in the spleen, which helped slow down the spread of cancer. The most effective Val-ILs were those carrying antibodies against specific markers (CD11b or CD223), which target myeloid-derived suppressor cells (MDSC) or lymphocyte-activation gene 3 (LAG-3) on T cells, respectively.

This research shows that Val-ILs are not only effective but also easy to produce, making them a promising new approach for treating blood cancers. This innovative technology could offer a more precise and effective way to eliminate cancer cells by harnessing targeted nanoparticles.

**More information:** Aleksandra Georgievski et al, Valrubicin-loaded immunoliposomes for specific vesicle-mediated cell death in the treatment of hematological cancers, *Cell Death & Disease* (2024). DOI: 10.1038/s41419-024-06715-5

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