Transcytosic Nanomedicine for EPR-Independent Cancer Drug Delivery

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The enhanced permeability and retention (EPR) effect or so-called "passive tumor accumulation" has been the basis for design of cancer nanomedicine; however, the EPR features are much less characteristic and highly heterogeneous in human tumors, resulting in unsatisfactory clinical efficacies of current nanomedicines. We developed a strategy using nanocarriers to induce transcytosis of tumor endothelial and cancer cells and enable nanomedicines to actively extravasate into and infiltrate in solid tumors, which led to radically increased anticancer activity, i.e., completely eradicating small solid tumors (~100 mm^3) and large established tumours of clinically relevant sizes (~500 mm^3) and significantly extending the survival of mice bearing orthotopic pancreatic tumours. So carrier-induced transcytosis of tumor endothelial cells enables EPR-independent extravasation of nanomedicines and overcomes the inherent extravasation and infiltration dilemmas of nanomedicines.

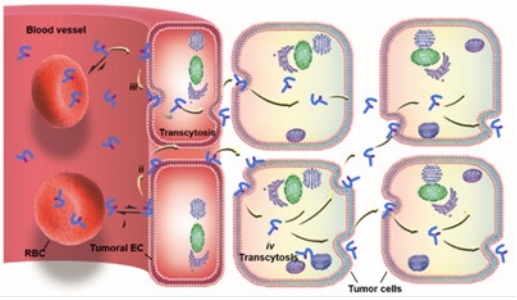

Figure 1: Transcytosis enabled-active extravasation and tumor penetration

References

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