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Interactions between interstitial fluid and tumor microenvironment in chemotherapy

Interstitial fluid, a solution filling the space between stromal cells, provides a means of delivering various molecules (such as nutrients, oxygen or drugs) to the cells, as well as removal of metabolic waste. In tumorous tissues, the transport of anti-cancer drugs is moderated by differences in interstitial fluid pressure that varies in different tumors and at different tumor sides, as well as by changes in stromal tissue structure. I will discuss computational simulations showing how tumor tissue metabolic state (its oxygenation and acidity) become modified due to actions of chemotherapeutic drugs leading to the emergence of tumor zones with potentially drug-resistant cells and/or to tumor areas that are not exposed to drugs at all. Both of these phenomena can contribute to the moderate clinical success of many anticancer drugs.