



**Wolfson Department of Chemical Engineering Special Seminar  
Lecture Hall 6, Wolfson Department of Chemical Engineering,  
Monday January 20, 2020 at 11:00**

**Targeting the tumor microenvironment with nanotechnology**

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Cancer is the leading cause of morbidity and mortality in developed countries. A tumor tissue is composed of cancer cells and of non-cancerous stromal cells, here termed the microenvironment. Recent studies have demonstrated that there is a direct link between the tumor microenvironment and the ability of cancer cells to invade adjacent tissues and metastasize. Furthermore, there is increasing evidence that environmental changes within the tumor tissue can lead to drug resistance and consequently to treatment failure. Therefore, our hypothesis is that a multi-targeting drug strategy, which targets the cancer cells as well as key components of the tumor microenvironment, will significantly improve the clinical outcomes.

In our research, we designed liposomes that interfere with primary metabolic processes of the tumor microenvironment, including acidification, by delivering alkaline buffer to the tumor. We examine how such a treatment affects tumor progression and sensitivity to medicine.

We found that combined targeting of the cancer cells and the tumor microenvironment by liposomal bicarbonate and doxorubicin enhances tumor response to doxorubicin compared to applying doxorubicin as the only treatment. We found that the enhanced activity of doxorubicin is owed to the increased uptake of doxorubicin into 4T1 triple negative breast cancer cells in the presence of bicarbonate.

**Refreshments will be served at 10:45**