

Title : Role of microenvironment in cancer progression : A multiscale approach

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Abstract :

Cancer is a complex, multiscale process, in which genetic mutations occurring at a sub-cellular level manifest themselves as functional changes at the cellular and tissue scale. The importance of multiscale modeling of tumour cell/microenvironment interactions is currently of great interest. Both the immediate microenvironment (cell-cell or cell-matrix interactions) and the extended microenvironment (e.g. vascular bed) are considered to play crucial roles in tumour progression as well as suppression. Stroma is known to control tumor growth and invasion to surrounding tissue. However, it also prohibits therapeutics from accessing the tumor cells, thus causing drug resistance. Therefore, a thorough understanding of the microenvironment would provide a foundation to generate new strategies in therapeutic drug development. A multiscale mathematical model has been developed in order to understand this complex relationship between tumor cells and host tissue.