

The tumour microenvironment as a sieve to filter out large cells

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The tumour microenvironment (TME) consists of a collagen matrix (and other factors). This matrix has pores of different diameters. T cells are small and so can pass through small pores. Other bigger cells both cancer cells and immune cells are unable to pass through the matrix. Thus, the TME acts as a filter and induces a gradient in immune cell size from the largest at the TME periphery to the smallest adjacent to the tumour. We study this gradient and the cross-repressive interactions that occur between immune-helping and immunosuppressive cells and factors, e.g. M1-like and M2-like macrophages. We use mathematical modelling to generate predictions on the thickness of the TME and the speed of passage of cytotoxic T lymphocytes through it.