Impact of human bladder cancer cell architecture on autologous T-lymphocyte activation

To investigate the influence of tumor cell architecture on T-cell activation, we used an autologous human model based on 2 bladder tumor cell lines as targets for cytotoxic tumor-infiltrating lymphocytes (TILs). These tumor cell lines were grown in vitro as either standard 2-dimensional (2D) monolayers or 3-dimensional (3D) spheroids. T-cell activation was determined by measuring the production of three major cytokines (tumor necrosis factor, granulocyte/macrophage colony-stimulating factor and interferon-gamma), known to be secreted by most activated TILs.

Changes in the architecture of target cells from 2D to 3D induced a dramatic decrease in their capacity for stimulating TILs. Interestingly, neither TIL infiltration nor MHC class I, B7.1 costimulatory or lymphocyte function-associated factor-3 adhesion molecule downregulation played a major role in this decrease. These findings demonstrate that tumor architecture has a major impact on T-cell activation and might be implicated in the escape of tumor cells from the immune system.