

## Functional In Vitro Testing Protocols for Studying Cell-Material Interactions.

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Cytotoxicity testing of biomaterials is a vital and fundamentally important step in the development of biomaterials. Unfortunately, cell-materials interaction based on cytotoxicity testing provides little information beyond whether or not a given material is unsuitable. A critical missing piece in the armament of biomaterials tests is systems that provide predictive feedback on how the cell senses the biomaterials specimen in question. We have been working on two systems based on this principle. The first is a cytokine-profiling assay that analyzes the cytokines expressed by monocytes seeded onto the surface of biomaterials. This system can be used to assess whether a given material invokes an inflammatory reaction in the cells that interrogate the specimen surface. The second is a fetal rat pup neuron-glia cell culture system that reproduces many of the hallmarks of the gliosis reaction in response to the presence of a material seeded into the culture. In both systems, results show that while the presence of the material affects cellular response, the material-dependent response is subtle compared to the response of many soluble factors introduced into the culture.