Simulating the migration of multiple cancer cells in the bloodstream KENG-HWEE CHIAM, Institute of High Performance Computing, Singapore — We model the migration of cancer cells that have broken away from a tumor and are circulating in the bloodstream. Using the immersed boundary method and culling from literature the material properties of cancer cells, we solve for the deformation of the cells represented as "immersed boundaries" being advected by the shear flow of the bloodstream. We solve for the magnitude of the deformation as a function of the flow magnitude as well as the adhesive properties between the cancer cells and the endothelial cells of the bloodstream. We also simulate the migration characteristics as a function of the migrating cell density. From these, we calculate rough approximations of the metastatic rate and efficiency.

Keng-Hwee Chiam
Institute of High Performance Computing, Singapore