Illuminating Bad Behavior: Quantifying Tumor Cell Activities on Nano-Engineering Surfaces

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11:00 A.M. – 12:00 A.M. — Thursday, September 13
WCJ Library 6th floor room 600

After decades of research, cancer remains one of the leading causes of death. Cancer turns fatal when metastasis leads to the spread of rogue cells through blood stream. These cells, known as circulating tumor cells (CTCs), eventually land on distant organs and form new tumors. Detection and enumeration of these CTCs in peripheral blood can be an effective tool for early cancer diagnosis. And early diagnosis results into highly effective treatments. This talk will focus on behavior of tumor cells that show distinct morphological patterns and enhanced activity when bound to functionalized nano-textured surfaces. Appropriate image processing to quantify changes in cell shapes, flatness on surface, pseudopod formation, growth in size and motility can provide easy, economical and rapid modality for diagnosis. The detection of tumor cells based on their physical behavior can be an objective addition to traditional histological approached. In the cancer elimination roadmap, identification and enumeration of CTCs in blood directly drawn from patients can be a game-changer.