

Although live metastatic cells cause death by their negative impact on vital organs and affecting the overall equilibrium of the body, paradoxically, no analysis is ever made on live cells to decide on therapy for patients or to discuss with them their prognosis. Dr. Merajver's proposed study will radically change the current practice, by creating an integrated metastases testing platform that has niches that realistically represent the biological and nutrient characteristics of different parts of the body where cancer cells can invade and grow. For instance, they will create small channels that resemble the lymphatic system, more turbulent channels that mimic the blood, an environment that simulates the lung, and so on. Then, they plan to test this platform device with human cells extracted from patient biopsies or surgical specimens and let them grow in those environments and test how they react when they are bathed in different types of anti-cancer drugs. Ultimately, the utility of this metastases testing platform would be to predict which treatments given to early cancer will prevent those cells that would have survived in the different niches from surviving at all, because the patient will be treated upfront with the most effective anti-metastatic therapy tailored to her/his tumor. In addition, for patients who develop metastases, this device will enable researchers to see where do the metastatic cells like to grow and which drugs kill them in those environments.