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Cancer-stroma evolutionary dynamics in stress-gradient microenvironment AMY WU, Princeton University, GUILLAUME LAMBERT, New York University, ROBERT AUSTIN, JAMES STURM, Princeton University, ZAYAR KHIN, ARIOSTO SILVA, Moffitt Cancer Center, PRINCETON PHYSICAL SCIENCES-ONCOLOGY CENTER TEAM, PRINCETON INSTITUTE FOR THE SCIENCE AND TECHNOLOGY OF MATERIALS TEAM — In order to study the evolution of drug resistance in cancer, it is important to mimic the tumor microenvironment, in which cells are exposed to not uniform concentrations but rather gradients of drugs, nutrients, and other factors Compared to traditional in-vitro methods, microfluidic structure enables better control of the temporal and spatial profile of gradients. Here we demonstrate a microfluidic Doxorubicin gradient environment with heterogeneous landscape, and culture multiple myeloma (8226-S, expressing RFP) and bone marrow stroma (HS-5, expressing GFP) cell lines together. The myeloma cells are not directly motile, but they are able to migrate via the adhesion to motile stroma cells. The indirect motility mechanism of the myeloma cells is crucial for the adaptation to stress environment. Finally, we will report the co-culture dynamics under the stress of doxorubicin gradients, observing for cellular migrations and growth

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