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Tumor Cell-Organ Microenvironment Interactions in the Pathogenesis of Cancer Metastasis

Robert R. Langley and Isaiah J. Fidler

Department of Cancer Biology, The University of Texas M. D.
Anderson Cancer Center, Houston, Texas 77030

Correspondence: Address all correspondence and requests for reprints to: Dr. Robert R. Langley, Department of Cancer Biology, Unit 173, The University of Texas M. D. Anderson Cancer Center, 1515 Holcombe Boulevard, Houston, Texas 77030. E-mail: rlangley@mdanderson.org

The process of cancer metastasis is sequential and selective and contains stochastic elements. The growth of metastases represents the endpoint of many lethal events that few tumor cells can survive. Primary tumors consist of multiple subpopulations of cells with heterogeneous metastatic properties, and the outcome of metastasis depends on the interplay of tumor cells with various host factors. The findings that different metastases can originate from different progenitor cells account for the biological diversity that exists among various metastases. Even within a solitary metastasis of proven clonal origin, however, heterogeneity of biological characteristics can develop rapidly.

The pathogenesis of metastasis depends on multiple interactions of metastatic cells with favorable host homeostatic mechanisms. Interruption of one or more of these interactions can lead to the inhibition or eradication of cancer metastasis. For many years, all of our efforts to treat cancer have concentrated on the inhibition or destruction of tumor cells. Strategies both to treat tumor cells (such as chemotherapy and immunotherapy) and to modulate the host microenvironment (including the tumor vasculature) should offer additional approaches for cancer treatment. The recent advances in our understanding of the biological basis of cancer metastasis present unprecedented possibilities for translating basic research to the clinical reality of cancer treatment.

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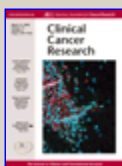
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