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Platelet-derived growth factor stimulates migration and proliferation of melanoma cells

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Melanoma is one of the most lethal and drug-refractory of human cancers, and is steadily increasing in frequency worldwide. In initial experiments using fish from the genus *Xiphophorus*, we established a melanoma cell line, XM, capable of forming pigmented melanomas in fish embryos *in vivo*.

We chose these fish as a model because specific *Xiphophorus* interspecies hybrids show an inherited predisposition for melanoma, and have been used for decades in classical genetic approaches to the study of oncogenes and tumor repressor genes. Previously we found that XM cells were growth-responsive to the peptide mitogen platelet-derived growth factor (PDGF). Little information currently exists on direct effects of PDGF on melanoma cells. The peptide also affected XM cellular morphology in a manner suggestive of increased cell migration. Here we report that that PDGF increased cell migration of XM cells, as well as migration and proliferation of the human melanoma cell line WM266. We hypothesized that PDGF-stimulated cell migration is related to mitogen effects on the myristoylated alanine rich C-kinase substrate (MARCKS). This is an actin-binding modulator of cell adhesion that can be altered in activity by phosphorylation through isozymes of protein kinase C, enzymes activated by PDGF and other mitogens. Results indicate that mitogen treatment led to release of MARCKS from actin filaments, possibly increasing cellular migration potential. Further experiments are aimed at determining if PDGF stimulation and MARCKS alteration plays a role in the rapid and extensive metastasizing potential of human melanoma. Supported in part by Seed Funds from the Georgia Gwinnett College VPASA.

Biography

David W. Barnes received his B.A degree in molecular biology and Ph.D. in Microbiology from Vanderbilt University. He was Professor of Biochemistry and Biophysics at Oregon State University, where he received American Cancer Society Faculty Research Award, and currently is Professor of Biology at Georgia Gwinnett College. He is the author of over 130 scientific publications and has edited nine books on peptide growth factors and cell physiology *in vitro*. His laboratory was the first to establish a number of unique cell lines, including epidermal growth factor-dependent neural stem cells, zebrafish embryonal cell cultures, and marine cell lines from dogfish shark and fugu (pufferfish)

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