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Role of monocyte chemoattractant protein-1 (MCP-1/CCL2) in migration of neural progenitor cells toward glial tumors.

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Neural progenitor cells (NPCs) have been investigated as potential vehicles for brain tumor therapy because they have been shown to migrate toward central nervous system gliomas and can be genetically engineered to deliver cytotoxic agents to tumors. The mechanisms that regulate migration of NPCs to tumors are not fully understood. By means of microarray analysis, polymerase chain reaction, enzyme-linked immunosorbent assay, and immunohistochemistry, we found that monocyte chemoattractant protein-1 (MCP-1/CCL-2) was expressed in experimental brain tumor cells in vivo and in vitro. CCR2, the receptor for MCP-1, was expressed on C17.2 NPCs. We used a modified Boyden chamber assay and found increased migration of NPCs in vitro in response to MCP-1. By means of an in vivo model for NPC migration, we found evidence of NPC migration toward areas of MCP-1 infusion in rat brains. An understanding of NPC migration mechanisms may be used to enhance delivery of cytotoxic agents to brain tumor cells. (c) 2009 Wiley-Liss, Inc.

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