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Hyaluronan Facilitates Invasion of Colon Carcinoma Cells *In Vitro* via Interaction with CD44

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Abstract: Hyaluronan (HA) and its biosynthetic enzymes, HA synthases (HAS1, 2, and 3) are thought to participate in cancer progression. We have shown previously that HA production and HAS3 expression are increased in metastatic colon carcinoma cells (SW620) when compared with cells isolated from a primary tumor (SW480). Because invasion of the extracellular matrix is a fundamental event in tumor growth and metastasis, we hypothesized that SW620 cells would show greater invasive capability than SW480 cells, that invasion is HA dependent, and that HA mediates invasion via interaction with a cell–surface receptor. Invasion into artificial basement membrane (Matrigel) was assessed *in vitro*. To assess HA functionality, HAS expression was inhibited in SW620 cells by transfection with antisense HAS constructs. Decreased HA secretion and retention in the transfectants were confirmed using competitive binding and particle exclusion assays. SW620 cells demonstrated greater invasion through Matrigel than did SW480 cells. Antisense transfection decreased Matrigel invasion by SW620 cells by >60%; addition of exogenous HA restored invasion. Because the cell–surface HA receptor CD44 has been implicated in cancer progression, HA–CD44 interaction was then inhibited by incubation with an anti-CD44 antibody. Anti-CD44 antibody impaired invasion into Matrigel by 95%. Taken together, these data suggest that pericellular HA is critical for colon carcinoma cell invasion and that this invasive capability is dependent on interaction with CD44.

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