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The role of podoplanin in cancer cell migration and invasion.

Gareth JONES
King's College, London, UK

Podoplanin is a small transmembrane glycoprotein up-regulated in human carcinomas and this is associated with poor prognosis. Its expression in tumour cells is linked to the adoption of a mesenchymal migratory phenotype *in vitro* and increased metastasis *in vivo*. These changes occur through the interaction of podoplanin with the membrane-cytoskeleton linkers ezrin and/or moesin (ERM proteins) and subsequent modulation of the Rho GTPases and actin cytoskeleton.
While it is clear that podoplanin plays an important role in tumour progression and metastasis, more mechanistic studies are needed to fully elucidate the function of this molecule. Since podoplanin has no obvious enzymatic motif within its structure, the identification of podoplanin-binding proteins is crucial to fully understand its specific role in cancer. We have recently identified CD44, the major hyaluronan (HA) receptor, as a novel partner for podoplanin. Podoplanin binding to CD44 at cell surface protrusions of migrating cells is required for podoplanin-enhanced cell migration and directionality in carcinoma cells.
Efficient cancer cell invasion is mediated by a combination of increased directed cell migration and acquiring the ability to remodel the extracellular matrix. We have recently found that podoplanin is a component of invadopodia; actin-rich protrusions that proteolytically degrade the extracellular matrix. The role of podoplanin in invadopodial organisation or function is currently unknown. Our current work is directed to explore the specific role of podoplanin in invadopodia formation and function.

Institut Européen de Chimie et Biologie
2, rue Robert Escarpit - 33607 Pessac, France
Tél. : +33(0)5 40 00 30 38 - Fax. : +33(0)5 40 00 22 15
www.iecb.u-bordeaux.fr