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Perineural invasion in pancreatic cancer

Perineural invasion (PNI) is a significant pathologic feature of pancreatic cancer (PCa). As another route of tumor spread besides vascular and lymphatic channels, PNI is considered to be an independent prognostic factor of PCa and is associated with the abdominal pain sensation and a higher risk of local recurrence after tumor resection. It is estimated that up to 90% of patients have intra-pancreatic nerve infiltration by tumor cells and that 69% have involvement of the extra-pancreatic nerve terminations. Despite increasing recognition of this metastatic process, there has been little progress in the understanding of molecular mechanisms behind PNI and, to date, no targeted treatment modalities aimed at this pathologic entity. However, it is generally believed that tumor microenvironment created a favorable environment for PNI in PCa. During the past, we have done a series of studies about PNI in PCa. Our data shows that the expression of sonic hedgehog (SHH), CXCR4, and hyperglycemia is correlated with PNI in PCa. Paracrine SHH protein derived from PCa cell could activate Hh pathway of PSCs, and increase MMP-2, MMP-9, and NGF expression in stellate cells to promote PCa growth, PNI, and peritoneal metastasis. CXCL12 derived from the peripheral nerves stimulated the invasion and chemotactic migration of CXCR4-positive PCa cells in a paracrine manner, eventually leading to PNI. Hyperglycemia could upregulate the expression of nerve growth factor in PCa cells and inhibit the migration of Schwann cells, leading to neurites exerted pathological regeneration, thus to increase PNI. In conclusion, the interaction between tumor cells and stromal cells plays a critical role in PNI of PCa.

Biography

Qingyong Ma has completed his PhD from Queen's University of Belfast during 1992 to 1996. He is the Professor and Head of Department of Surgery, First Affiliated Hospital of Xi'an Jiaotong University, Xi'an, China. He has published more than 100 papers in reputed journals and has been serving as an Editorial Board Member of repute.

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