REVIEW OF CLINICAL PHARMACOLOGY AND
PHARMACOKINETICS INTERNATIONAL
EDITION 24: 217 (2010)

Role of Pleiotrophin in Human Prostate Cancer Cell Growth *in vivo*

Sotiria Tsirmoula[1,#], Kostas Dimas[2,3,#], Panagiota Ravazoula[4] and Evangelia Papadimitriou[1]

[1]Laboratory of Molecular Pharmacology, Department of Pharmacy, University of Patras, GR26504 Patras, Greece
[2]Laboratory of Pharmacology-Pharmacotechnology, Basic Sciences Center, Biomedical Research Foundation of Academy of Athens, Athens, Greece
[3]Department of Pharmacology, Faculty of Medicine, University of Thessaly, Larissa, Greece
[4]Department of Pathology, Patras University Hospital, GR26500 Patras, Greece;
[#]They have equally contributed to this work

Key words: Heparin affin regulatory peptide, heparin-binding growth associated molecule, angiogenesis, tumour

SUMMARY. Pleiotrophin (PTN) is a heparin-binding growth factor with diverse biological activities, the best known being those related to the nervous system, tumor growth and angiogenesis. We have previously used an antisense strategy for inhibition of PTN expression in the human prostate cancer cell line LNCaP, in order to study the role of PTN in cancer cell growth and angiogenic potential in vitro. By decreasing the expression of endogenous PTN, we found that PTN was essential for LNCaP cell migration, anchorage-dependent and independent growth, as well as their potential to induce angiogenesis. The aim of the present work was to study the role of endogenous PTN in human prostate cancer cell growth and angiogenic potential in vivo. For this purpose, we stably transfected human prostate cancer PC3 cells with an antisense plasmid vector, in order to express reduced amounts of PTN (AS-PC3). We observed a decreased migration capability of AS-PC3 cells compared with the mock-transfected (PC-PC3) or the corresponding non transfected (PC3) cells, in line with our previous results with LNCaP cells. We then implanted PC-PC3 and AS-PC3 cells subcutaneously in immunocompromised mice. Xenografts of AS-PC3 cells grew significantly slower compared with PC-PC3 xenografts and the size of the tumors was smaller, in correlation with the amounts of endogenous PTN. Moreover, AS-PC3 tumors had significantly more extended necrotic areas compared with PC-PC3 tumors. Finally, lethality as well as the number of metastases was significantly higher in PC-PC3 compared with AS-PC3 xenografts. Collectively, these data suggest that PTN has a role in human prostate cancer cell growth in vivo and may be a good target for developing new therapies.