

Global Cancer Conference & Medicare Summit

September 15-17, 2014 Hyderabad International Convention Centre, India

Proline-rich tyrosine kinase 2 and its phosphorylated form pY881 are novel prognostic markers for non-small cell lung cancer progression and patients overall survival

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Background: Our previous study revealed that proline-rich tyrosine kinase 2 (Pyk2) is implicated in both anchorage-independent growth and anoikis resistance in lung cancer cells. This study aims to explore the expression and clinical significance of Pyk2 and its phosphorylated forms in non-small cell lung cancer (NSCLC).

Methods: The mRNA and protein levels of Pyk2 or cancer stem cell (CSC) markers were either examined by RT-PCR or Western blotting. An immunohistochemistry (IHC) assay was conducted to analyze the expression of Pyk2 and its phosphorylated forms in 128 NSCLC cases.

Results: The levels of Pyk2 mRNA, total protein, and its phosphorylated forms (pY402 and pY881) were higher in lung cancer lesions than in the paired non-cancerous tissues. The IHC analysis showed the levels of the Pyk2 and Pyk2 [pY881] proteins were highly expressed in 70 (54.7%) and 77 (60.2%) cases, respectively. Both Pyk2 and Pyk2 [pY881] were independent prognostic factors for NSCLC patients, and had a potentially predictive role in NSCLC drug treatment. The gain and loss study of Pyk2 function revealed that Pyk2 could up-regulate CSC marker expression and enhance the transforming ability of NSCLC cells.

Conclusion: Pyk2 and phosphorylated Pyk2 [pY881] are potential prognostic factors and therapeutic targets for NSCLC.

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