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### **Epidermal growth factor receptor (EGFR) targeted multifunctional photosensitizers for bladder cancer Imaging (fluorescence and PET) and photodynamic therapy (PDT)**

This study describes the advantages of a multifunctional  $^{124}\text{I}$ -labeled [methyl-(1'-m-iodobenzyloxy)ethyl-3-devinyl-pyropheo phorbide-a (PET-ONCO) over the  $^{18}\text{F}$ -fluorodeoxy glucose ( $^{18}\text{F}$ -FDG) for imaging bladder cancer by positron emission tomography (PET). As a non-radioactive analog, it can be used for fluorescence-guided PDT of bladder cancer. In our attempt to develop EGFR targeted multifunctional PS, an erlotinib moiety known for targeting EFGR was conjugated either at position-3 or at position-17 of the iodinated PS following the well-established Sonogashira cross coupling methodology. The comparative in vitro efficacy (cell uptake,

intracellular localization and photosensitizing efficacy and EGFR target specificity) of the iodinated PS with and without an erlotinib moiety was investigated in UMUC-3 (EGFR positive) and T24 (EGFR low) cell lines. Among the parent PS and the erlotinib conjugated analogs, the PS containing the erlotinib moiety at position-17 showed best PET imaging and PDT efficacy. Interestingly, the position-3 erlotinib-PS conjugate was even less effective than the corresponding non-erlotinib analog. The position-17 erlotinib conjugate also showed higher in vivo uptake (determined by fluorescence), PET-imaging ability and PDT efficacy nude mice bearing UMUC3 tumors.

#### **Biography**

Ravindra K Pandey is a Distinguished Member, Professor of Oncology and Director of Pharmaceutical Chemistry at Roswell Park Cancer Institute, Buffalo, NY, with extensive experience in drug design, drug delivery, molecular recognition, and tumor diagnostics. He has received several WNY inventor of the year awards, international award on heterocyclic chemistry, excellence in PDT award by ICPP, the American Chemical Society's Jacob Schoelkopf award and China 1000 Talent Scientists Award for his contribution in translational research. Dr. Pandey is the Founder and Chief Scientific Officer (CSO) of Photolitec, LLC, a spin-off company of Roswell Park Cancer Institute. He has published around 300 research papers, review articles, book chapters, a book on cancer-imaging/therapy and several patents.

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