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Novel approach to target aggressive breast cancer cells using a cannabis compound

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Dysregulated expression of the transcriptional regulator, Id-1, leads to breast cancer progression and metastasis. Specifically, we found high levels of Id-1 in breast tumor biopsies from human patients with aggressive cancer. Ectopic expression of Id-1 in non-aggressive human cancer cells rendered them highly proliferative and invasive. Conversely, human breast cancer cell aggressiveness was decreased in culture by siRNA, shRNA or antisense RNA directed against the Id-1 gene. Next, we asked whether Id-1 could be exploited as a therapeutic target to treat metastatic cancers. Using tumor-bearing animals and non-viral systemic gene targeting technique, we showed that reduction of Id-1 levels significantly decreased the metastatic spread of breast cancer cells. Since Id-1 expression is scarce in most mature adult tissues, a majority of normal cells would not be affected by systemic therapy targeting this gene. We recently determined that the cannabinoid compound, cannabidiol (CBD), inhibited a program controlling tumor cell invasion and proliferation through down-regulation of Id-1 gene expression. We also discovered the ability of this non-psychoactive, non-toxic, cannabinoid to significantly reduce the metastatic spread of aggressive breast cancer cells *in vivo*. CBD is now available in medical marijuana dispensaries and is being used by cancer patients who are desperate to try novel approaches to treat their metastatic disease. Hopefully, CBD should become available for clinical trials within the next few years.

Biography

Pierre-Yves Desprez joined the University of California at Berkeley after completion of his Doctoral thesis at the University of Lyon in France. He has been a Principal Investigator at the California Pacific Medical Center Research Institute in San Francisco since 1996. The laboratory was the first one to show that the transcriptional regulators, Id genes and proteins, were promising targets for the suppression of invasive and metastatic cancers. Recently, his discovery that a cannabinoid compound represented the first non-toxic agent that decreased Id-1 expression and consequently breast tumor aggressiveness and metastasis, was reported worldwide by several news agencies.

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