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Computer Simulation of Specificity for In Vivo Breast Cancer Diagnosis by Carbogen-Enhanced Differential 'Femton' Oximetry ('DFO') BOGDAN C. MAGLICH, ANNA Z. RADOVIC, BioAtom Div., CALSEC Calif. Sci. & Eng. Corp., ORHAN NALCIOGLU, U. of California, Irvine, J.K. SHULTIS, C.J. SOLOMON, Kansas State University — We performed computer simulation study of noninvasive diagnosis by DFO of hypoxia in a 1 cm tumor in 10 cm breast. Unlike *in vitro* cases (previous Abstract), background γ 's from non hypoxic tissue will mask tumor γ signal, thus true hypoxia Q = -0.9 will be observed as apparent Q' = - 0.1. We propose to amplify Q' by replacing air breathing with carbogen (O_2 95%, CO_2 5%) thus making use of vasco-constrictive property that carbogen breathing increases O in normal tissue 3-fold, while O in subcutaneous hypoxic tumors remains const. This enhances apparent Q' to -0.25, shown to be detectable by DFO with specificity 99%. Principle of Femto Onco Diagnostics with and w/o carbogen, will be tested on R3230 tumors in Fischer rats at UCI Center for Functional Onco Imaging. Our probe ('OncoSensor') requires imager guidance, except for palpable tumors.

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