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Experimental *In Vitro* Test of Differential 'Femton' Oximetry ('DFO') Principle for Noninvasive Quantitative Diagnosis of Hypoxia CHRIS DRUEY, ANNA Z. RADOVIC, BOGDAN C. MAGLICH, BioAtom Div., CALSEC Calif. Sci. & Eng. Corp, Costa Mesa, CA 92626 — We report a high-resolution measurement of feasibility of noninvasive diagnosis of hypoxia *via* difference in γ rates from n + O –> O + γ + n between tumor, O_1, and normal tissue, O_2, using $\lambda_{DB} \approx 1$ fm neutrons ('femtons'), which 'count' atoms unaffected by molecular bonds. Q = (O_1-O_2)/O_1 quantifies hypoxia (<0), oxia (>0), and healthy tissue (=0). Hypoxic breast/prostate tumors have -0.80> Q <-0.96. DNA nucleotides dAdenosine, dCytosine and Thymidine, differing by 1 O atom, were irradiated with 14 MeV n's. We observed 1 atom as 0.012 ± .004 (3σ) γ rate difference. This implies that DFO would diagnose *stand alone* hypoxia Q = -0.10 and -0.25 with specificity 95% and 99%, respectively. As benchmark, we measured relative genome lengths of 2 mammal tissues to be Q = -0.12 ± .02, vs. 0.1 expected. These data suggest Femton Onco Physics as path to needle-less biopsy.

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