1070-16-19 **Atabong T Agendia*** (tagendia@yahoo.com), **M O Oyesanya** (mose.oyesanya@unn.ng) and **G A Ngwa**. *A fractional reaction diffusion model for tumor development as a result of deformation (destruction) of biological protein materials (BPM) in the body.*

A fractional reaction diffusion model for tumor to capture the fractal nature of tumor and the random but continuous deformation and destruction of biological protein materials in a human system is proposed. We carried out an indebt fractional analysis of this model before simulating the resulting non-linear system numerically. In the fractional diffusion model, the second order integer derivative with respect to space is replaced with a non integer value. Such anomalous diffusive models have proven very useful in fluid flow in porous media and Brownian motion. A set of five equations representing, the stress mechanics (P), the glycolitic release of H+ in the tissues (H), the reserved temperature of the tissue (T), the normal tissue mechanics (N) and the tumor tissue mechanics (M) forms the clone of the model. Our analysis shows that there exists at least one non-trivial equilibrium state under which if the bond breaking speed is kept within a certain magnitude, the tumor will metastasized into full grown cancer. As a result, we equally show that increasing the amount of water in the body system can remedy the metastasis of tumor into cancer. (Received December 04, 2010)