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**Ranadhir Roy\*** (rroy@utpa.edu), Mathematics Department, University of Texas Pan American, 1201 West University Drive, Edinburg, TX 78539, and **Daniel N Riahi**. *Investigate the characteristics of blood flow in brain tumor using Finite Element methods.*

Many brain tumors are highly invasive and therefore extremely difficult to treat. In order to prevent the reoccurrence of tumor cells, anticancer drugs are used after surgery. Many studies have demonstrated a better outcome with concurrent application of radiotherapy and chemotherapy. Thus combined radiotherapy and chemotherapy treatment can improve the survival rate. Our major objective in this work is to understand the physiology of blood flow in a brain tumor, and also to investigate the effect of concurrent application of two anti-cancer drugs in a brain tumor. Drug transport in the tumor interstitial depends on convection and diffusion. To investigate characteristics of blood flow through a spherical tumor, a couple convection-diffusion-reaction models for simulating interaction between two anti cancer drugs has been developed. The governing equations with appropriate boundary conditions are used for brain tumor geometry. The interstitial fluid pressure, velocity and drugs concentration are calculated using a finite element method. Triangular elements are used to solve these problems. The finite element solution of this problem is presented and demonstrated that our numerical techniques can solved convection diffusion equations. (Received September 10, 2013)