1159-92-13 **Tuan A Phan*** (tuanpa86@nmsu.edu), Department of Mathematical Sciences, 1290 Frenger Mall, MSC 3MB / Science Hall 236, Las Cruces, NM 88003-8001, and **Dang H Nguyen** and **Jianjun P Tian**. *Deterministic and stochastic modeling for PDGF-driven gliomas reveals a classification of gliomas.*

Motivated by our study of in filtrating dynamics of immune cells into tumors, we propose a stochastic model in terms of Ito stochastic differential equations to study how two parameters, the chemoattractant production rate and the chemotactic coefficient, influence immune cell migration and how these parameters distinguish two types of gliomas. We conduct a detailed analysis of the stochastic model and its deterministic counterpart. The deterministic model can differentiate two types of gliomas according to the value range of the chemoattractant production rate as two equilibrium solutions, while the stochastic model can also differentiate two types of gliomas according to the value ranges of the chemoattractant production rate and chemotactic coefficient with thresholds as one non-zero ergodic invariant measure and one weak persistent state when the noise intensities are small. When the noise intensities are large comparing with the chemotactic coefficient, there is only one type of glioma that corresponds to a non-zero ergodic invariant measure. Using our experimental data, numerical simulations are carried out to demonstrate the properties of our models, and we give medical interpretations and implications for our analytical results and numerical simulations. (Received June 26, 2020)