

1077-35-1996

Linlin Su* (lsu@wpi.edu), Department of Mathematical Sciences, Worcester Polytechnic Institute, 100 Institute Road, Worcester, MA 01609, and **Roger Lui**. *Advance of Advantageous Genes in a Three-Allele Population Genetics Model*. Preliminary report.

Assume that certain gene resides at an autosomal locus and occurs in three forms: A_1 , A_2 and A_3 , called alleles. Let p_i be the frequency of allele A_i . Then, assuming that population density is spatially independent, and Hardy-Weinberg equilibrium holds, it can be shown that p_i 's satisfy a reaction-diffusion system of two equations involving the frequencies of two of the alleles (noting that p_i 's add up to 1). We investigate the propagation of advantageous genes by studying traveling wave solutions to the system. Our work is motivated by the work of Fisher (1937), the work of Kolmogoroff, Petrovsky and Piscounoff (1937), and the work of Aronson and Weinberger (1975, 1978) on the study of the two allele problem where a single reaction-diffusion equation is studied. (Received September 21, 2011)