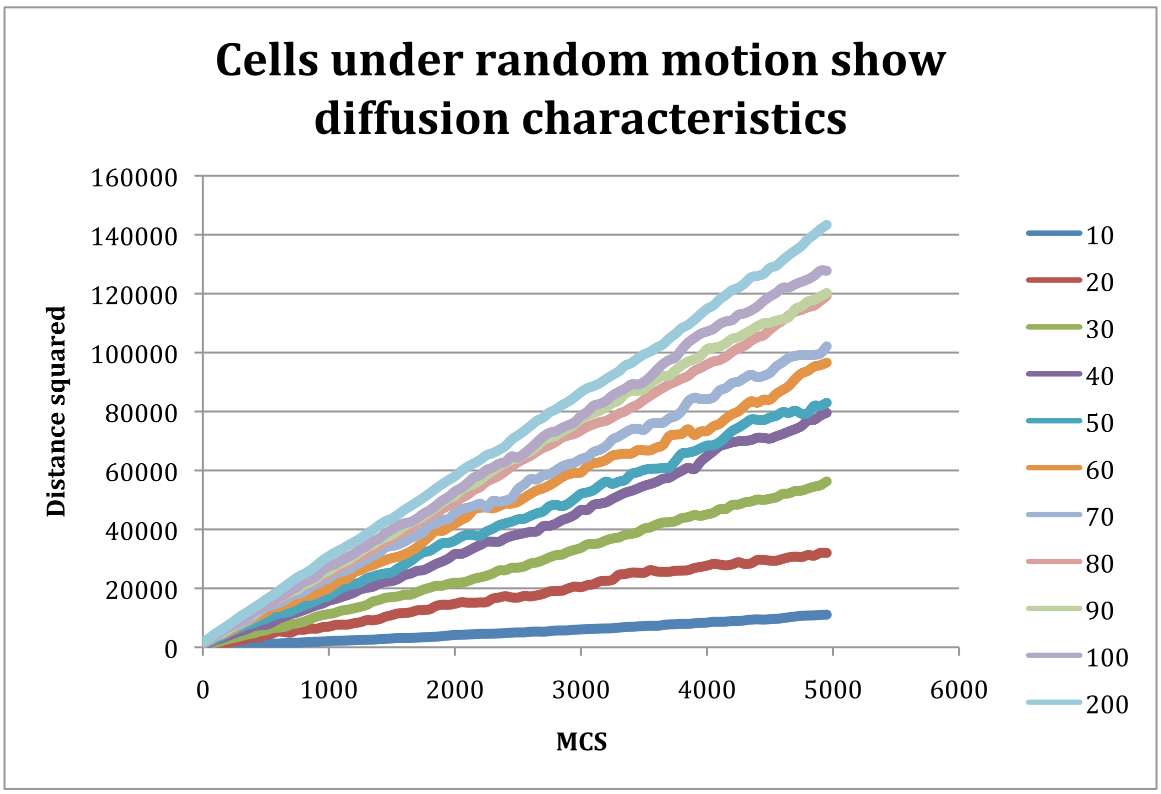
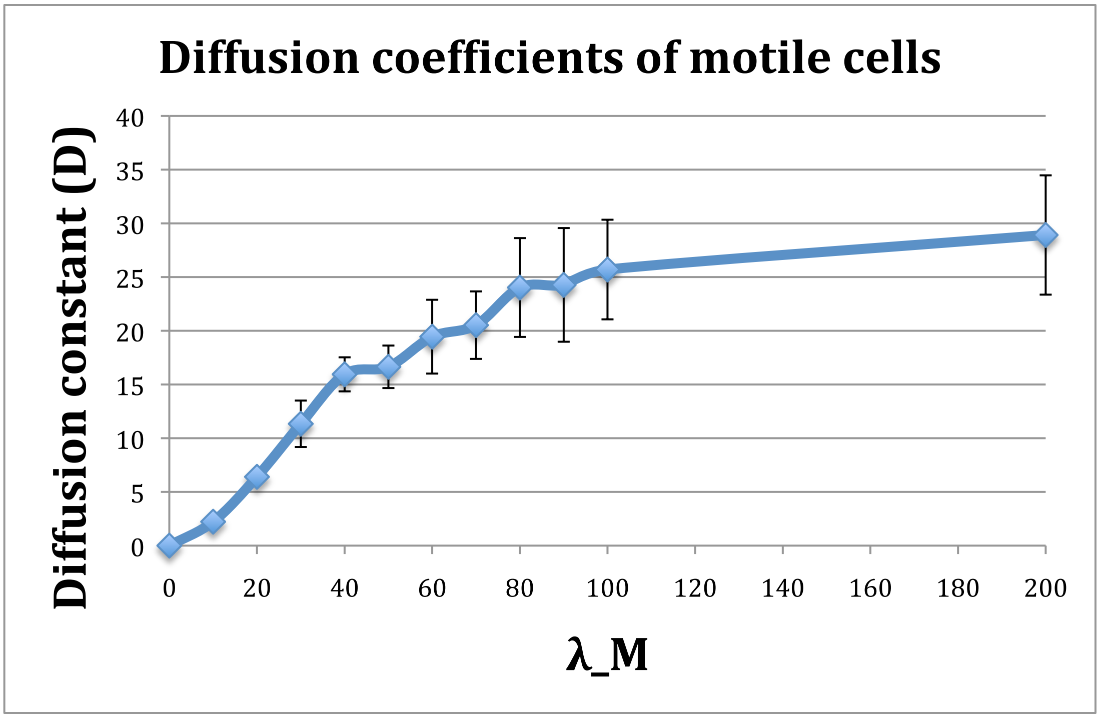
We investigated the evolution of isolated cells using the Cellular Potts model described in Sec. 2 in the main text of the paper. In particular, a single cell was assigned motility λ_M between 0 and 200, and λ_V was assigned such that the cell compression $C(\lambda_V, \lambda_M) = C(2,0)$, where C is given by Equation (3.3). In order to prevent cell-cell interactions, the cell is prohibited from proliferating. The distance traveled is recorded every 10 MCS for 5000 MCS, and 200 such trials are conducted. The mean of the squares of each of the time points from all trials are calculated and plotted in Supplementary Fig. 1. Similar results may be obtained (not shown) as functions of the effective temperature T_m or the time interval between changes in the cell orientation.

The cells are found follow the relation $< r^2 >= Dt$, where r is the displacement of the cell, D is the diffusion coefficient, and t is the time elapsed. The curves for each of the motilities in Supplementary Fig. 1 can be fit to the diffusion relation. The diffusion constants for each curve, effectively the slope of the best fit line, are calculated and plotted in Supplementary Fig. 2. The standard deviations are generated from diffusion constants over each of the 200 trials. Thus, isolated cells undergoing a random walk can be described by a diffusion model.



Supplementary Figure 1: Squared of cell displacement plotted against time for different lambda_M values. The volume constraint, lambda_V, has been adjusted, as described in Sec. 3.1, to compensate for motility-induced cell compression. The displacement squared is proportional to time elapsed, as in diffusion.



Supplementary Figure 2: Diffusion coefficients were derived from the slope of the best-fit lines in Supplementary Fig. 1.