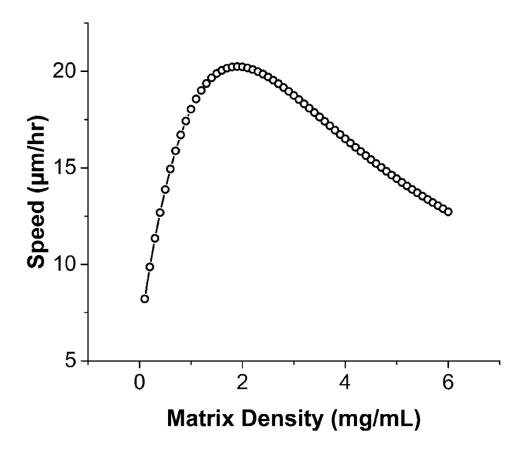Figure S1: Biphasic response of cellular speed as a result of matrix stiffness. As other models have reported, contractile force may be treated as a variable entity due to the mechano-sensing ability of integrins. When this behavior incorporated into migration models, a biphasic migration response to matrix stiffness is observed. In order to prove that our model is capable of this addition and increase its relevancy in future studies, we have designed the contractile force to vary with the matrix concentration using the sigmoidal function: $C = \dfrac{1}{(1 + e^{-matrix})}$, where C is the contractile force and $matrix$ represents the concentration of the collagen gel. This function allows for the contractility to increase with increasing matrix density until reaching an asymptotic limit as commonly described. When applying this relationship to the model we observe the characteristic biphasic response of migration speed with respect to matrix concentration and inherently matrix stiffness. By

augmenting the model with a varying contractile force one may be able to probe different cell and

matrix types where the biphasic effect is much more prevalent.