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v4 Sensitivity Analysis

Protocol:

Feature Variation:

1. OFAT thy1n count [ 0 10 100 ] n = 5
2. OFAT thy1p count [ 0 10 100 ] n = 5
3. OFAT degrader count [ 0 10 100 ] n = 5
4. Bivariate AS-entry-threshold and AS-entry-random
   1. Entry Threshold: [ 0 3 30 ] n = 5
   2. Entry Random: [ 0 10 100 ] n = 5
5. Global Sampling thy1n, thy1p, degrader, AS-entry-threshold, AS-entry-random
   1. Randomly sample n = 55 from relevant domains determined by variants 1-4

Labels:

1. Count medium patches
2. Count stiff patches
3. Count alveolar space patches with medium or stiff deposition

Reporters:

* % Medium patches: count patches with [pcolor = 128] / count patches
* % Stiff patches: count patches with [pcolor = 125] / count patches
* % Alveolar Patches With Collagen: count patches with [tissue-type = "alveolar-space" and pcolor != white] / count patches with [tissue-type = "alveolar-space"]

Preliminary Exploration:

This week, I have been exploring how different thresholds that allow the fibroblasts to enter the alveolar space (AS) affect their behavior. The threshold is calculated by how much collagen (the matrix value of the patch) has been deposited in the patches surrounding it (left, right, top, bottom). Interestingly, when I have the threshold at 15, the number of alveolar patches with collagen is higher than when the threshold is lowered to 5. I hypothesize this is because some of the thy1ps and degraders are easily crossing the border and getting stuck in alveolar space.

* After modifying the code so that only thy1ns can enter a “new” alveolar space, or white patch, the expect behavior occurs. It seems, preliminarily, that % alveolar patches with collagen inversely correlates with the AS-entry-threshold.

OFAT and Bivariate Default Parameters:

* Thy1p count = 10
* Thy1n count = 10
* Degrader count = 10
* P-collagen-deposition = 0.5
* N-collagen-deposition = 1.0
* Collagen-degradation = 0.5
* AS-entry-threshold = 15
* AS-entry-random = 50

Potential Bugs:

* When degraders remove collagen, not sure if color changes