

|                            |   | Cell Speed    |                        | Persistence           |                       |  |                         | Protrusion Dynamics in 3-D |                           |                         |  |   | Cell-Matrix Interactions in 3-D            |                          |                       |  |
|----------------------------|---|---------------|------------------------|-----------------------|-----------------------|--|-------------------------|----------------------------|---------------------------|-------------------------|--|---|--|--------------------------|-----------------------|--|
|                            |   | 3D cell speed | 2D cell speed          | 3D persistence time   | 2D persistence time   | 3D persistence distance                    | 2D persistence distance | Protrusion lifetime        | Average protrusion length | Protrusion max length   | Protrusion number /time                    | Protrusion growth rate                      | Traction                                   | Matrix total deformation | Matrix remodeling     | Traction per pseudopodia                   |
| Cell Speed                 | Slope   |               |                        |                       |                       |  |                         |                            |                           |                         |  |   |  |                          |                       |  |
|                            | R <sup>2</sup>                                |               |                        |                       |                       |  |                         |                            |                           |                         |  |   |  |                          |                       |  |
|                            |   | p value       |                        |                       |                       |  |                         |                            |                           |                         |  |   |  |                          |                       |  |
| Cell Speed                 | 3D cell speed                                 |               | -0.13<br>0.014<br>0.78 | -0.44<br>0.33<br>0.18 | -0.53<br>0.21<br>0.30 | <b>1.19</b><br><b>0.81</b><br><b>0.005</b> | -0.20<br>0.04<br>0.67   | -0.41<br>0.34<br>0.13      | 0.26<br>0.04<br>0.65      | 0.19<br>0.05<br>0.58    | <b>1.26</b><br><b>0.72</b><br><b>0.008</b> | <b>1.32</b><br><b>0.83</b><br><b>0.001</b>  | 0.56<br>0.65<br>0.02                       | 0.35<br>0.21<br>0.25     | 0.74<br>0.57<br>0.03  | 0.42<br>0.44<br>0.10                       |
|                            | 2D cell speed                                 |               |                        | 0.30<br>0.10<br>0.50  | 0.34<br>0.13<br>0.42  | 0.09<br>0.02<br>0.76                       | 0.21<br>0.07<br>0.58    | -0.24<br>0.14<br>0.36      | 0.29<br>0.06<br>0.58      | -0.21<br>0.04<br>0.65   | 0.07<br>0.01<br>0.78                       | 0.05<br>0.01<br>0.85                        | 0.23<br>0.13<br>0.37                       | 0.27<br>0.15<br>0.34     | -0.10<br>0.01<br>0.78 | 0.86<br>0.19<br>0.33                       |
| Persistence                | 3D persistence time                           |               |                        |                       | 0.28<br>0.10<br>0.49  | -0.37<br>0.05<br>0.64                      | -0.07<br>0.23<br>0.91   | 0.97<br>0.29<br>0.22       | 0.52<br>0.10<br>0.49      | 0.15<br>0.02<br>0.75    | -0.6<br>0.10<br>0.49                       | -0.66<br>0.12<br>0.44                       | -0.11<br>0.04<br>0.66                      | -0.13<br>0.03<br>0.71    | -0.40<br>0.26<br>0.25 | 0.02<br>0.36<br>0.98                       |
|                            | 2D persistence time                           |               |                        |                       |                       | -0.64<br>0.18<br>0.35                      | 0.94<br>0.67<br>0.02    | 0.44<br>0.07<br>0.56       | 0.20<br>0.14<br>0.41      | -0.08<br>0.009<br>0.84  | -0.77<br>0.20<br>0.31                      | -0.54<br>0.10<br>0.48                       | -0.61<br>0.14<br>0.40                      | -0.82<br>0.45<br>0.10    | -0.14<br>0.02<br>0.79 | -0.79<br>0.19<br>0.33                      |
|                            | 3D persistence distance                       |               |                        |                       |                       |  | -0.32<br>0.06<br>0.60   | -0.65<br>0.37<br>0.15      | 0.84<br>0.09<br>0.51      | 0.09<br>0.03<br>0.73    | <b>1.05</b><br><b>0.88</b><br><b>0.001</b> | <b>1.06</b><br><b>0.93</b><br><b>0.0004</b> | <b>0.86</b><br><b>0.84</b><br><b>0.004</b> | -0.34<br>0.39<br>0.13    | 0.96<br>0.51<br>0.07  | 1.04<br>0.75<br>0.01                       |
|                            | 2D persistence distance                       |               |                        |                       |                       |  |                         | -0.22<br>0.02<br>0.74      | 0.09<br>0.04<br>0.67      | -0.51<br>0.13<br>0.43   | -0.42<br>0.08<br>0.54                      | -0.04<br>0.001<br>0.95                      | -0.51<br>0.13<br>0.43                      | -0.61<br>0.33<br>0.18    | 0.03<br>0.001<br>0.95 | -0.66<br>0.17<br>0.35                      |
| Protrusion Dynamics in 3-D | Protrusion lifetime                           |               |                        |                       |                       |  |                         | 0.12<br>0.05<br>0.59       | 0.33<br>0.31<br>0.15      | -0.73<br>0.48<br>0.06   | -0.75<br>0.53<br>0.06                      | -0.51<br>0.27<br>0.24                       | -0.49<br>0.13<br>0.42                      | -0.74<br>0.29<br>0.17    | -0.57<br>0.25<br>0.25 |  |
|                            | Average protrusion length                     |               |                        |                       |                       |  |                         |                            | 0.64<br>0.52<br>0.04      | -0.01<br>0.0007<br>0.95 | 0.28<br>0.02<br>0.73                       | 0.15<br>0.09<br>0.46                        | 0.22<br>0.15<br>0.34                       | -0.06<br>0.007<br>0.85   | 0.43<br>0.02<br>0.78  |  |
|                            | Protrusion max length                         |               |                        |                       |                       |  |                         |                            |                           | -0.13<br>0.0005<br>0.96 | 0.02<br>0.0001<br>0.98                     | 0.19<br>0.11<br>0.43                        | 0.23<br>0.13<br>0.38                       | -0.04<br>0.002<br>0.91   | 0.32<br>0.02<br>0.75  |  |
|                            | Protrusion number/time                        |               |                        |                       |                       |  |                         |                            |                           |                         |  | <b>0.89</b><br><b>0.82</b><br><b>0.002</b>  | <b>0.86</b><br><b>0.70</b><br><b>0.009</b> | 0.37<br>0.11<br>0.42     | 1.21<br>0.70<br>0.010 | 0.86<br>0.63<br>0.03                       |
|                            | Protrusion growth rate                        |               |                        |                       |                       |  |                         |                            |                           |                         |  |   | 0.82<br>0.67<br>0.01                       | 0.47<br>0.18<br>0.29     | 1.03<br>0.53<br>0.04  | 0.83<br>0.58<br>0.05                       |
| Matrix Remodeling in 3-D   | Matrix max deformation (average of all beads) |               |                        |                       |                       |  |                         |                            |                           |                         |  |   |  | 0.62<br>0.47<br>0.06     | 0.80<br>0.32<br>0.14  | <b>1.06</b><br><b>0.88</b><br><b>0.002</b> |
|                            | Matrix total deformation                      |               |                        |                       |                       |  |                         |                            |                           |                         |  |   |  |                          | -0.15<br>0.01<br>0.77 | 1.24<br>0.68<br>0.02                       |
|                            | Matrix remodeling                             |               |                        |                       |                       |  |                         |                            |                           |                         |  |   |  |                          |                       | 0.38<br>0.18<br>0.35                       |
|                            | Matrix Max deformation (Per Cell)             |               |                        |                       |                       |  |                         |                            |                           |                         |  |   |  |                          |                       |  |

**Strong Correlation:**  
Slope  $\geq 0.80$  AND R<sup>2</sup>  $\geq 0.70$  AND p  $\leq 0.009$