

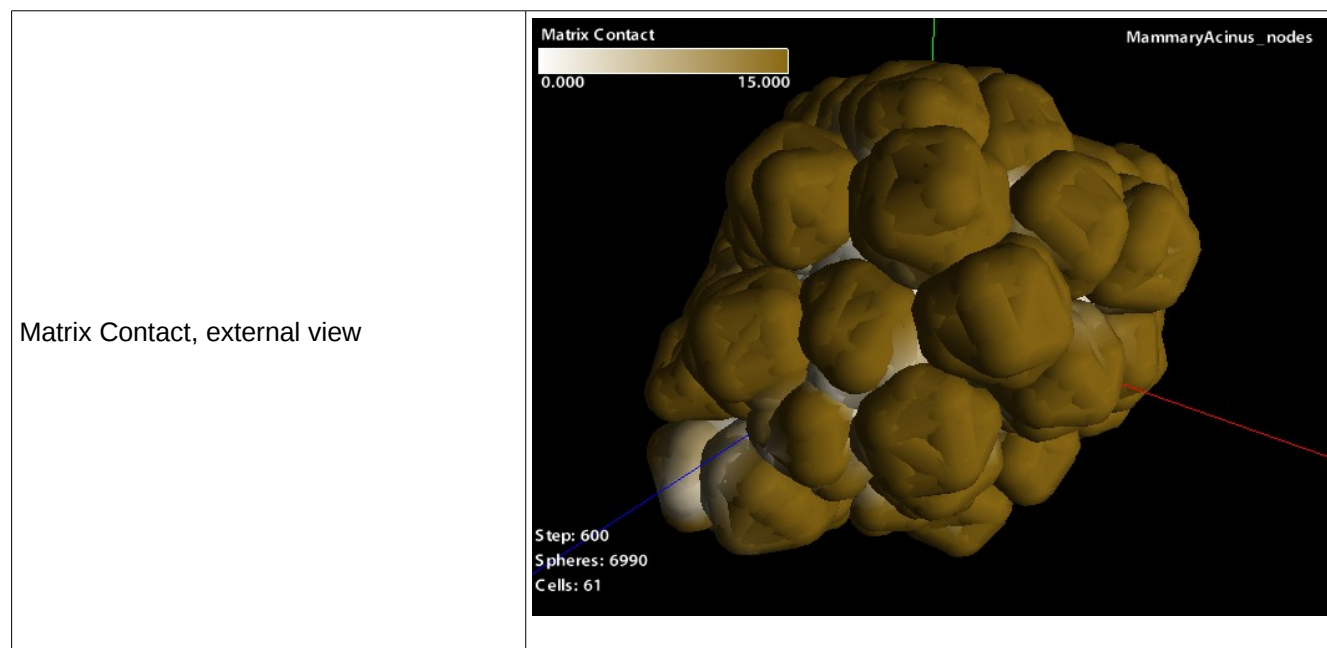
Mammary Acinus with Signaling Node Matrix

Mason Vail

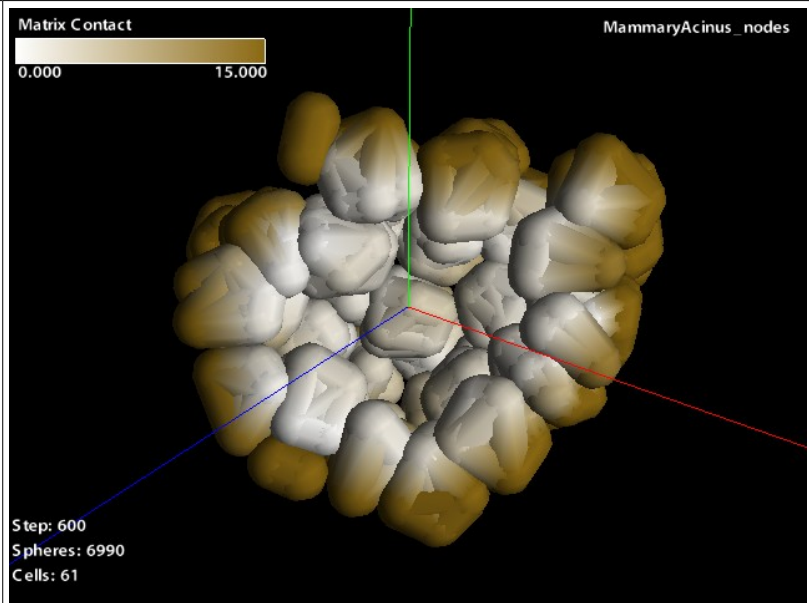
From Wiki page at <https://dev.cdres.int/projects/bic/wiki/MammaryAcinusSignalingNodes>.

As demonstrated in [SignalingNodes](#) and [EpidermisViralBarrier](#), cells displace the resources in occluded signaling nodes and present an obstacle for passage of node resources. The mammary acinus model as developed in cooperation with HMS utilized a cell line to represent the ECM "Matrigel" that provides signaling cues needed for acinar cells to distinguish "outside" and "inside" surfaces for polarization and maturation and to maintain survival signaling. While effective, the approximately 1200 Matrigel "cells" surrounding the acinus created an unwanted visual barrier and physics overhead. An alternative approach was attempted in January, 2010, using a grid of signaling nodes to hold matrix resources. As seen in the images below, the node grid was effective for acinus development. However, as expected, the acinus is more sensitive to leaks using the node grid approach than with the physically constrained Matrigel "cell" approach.

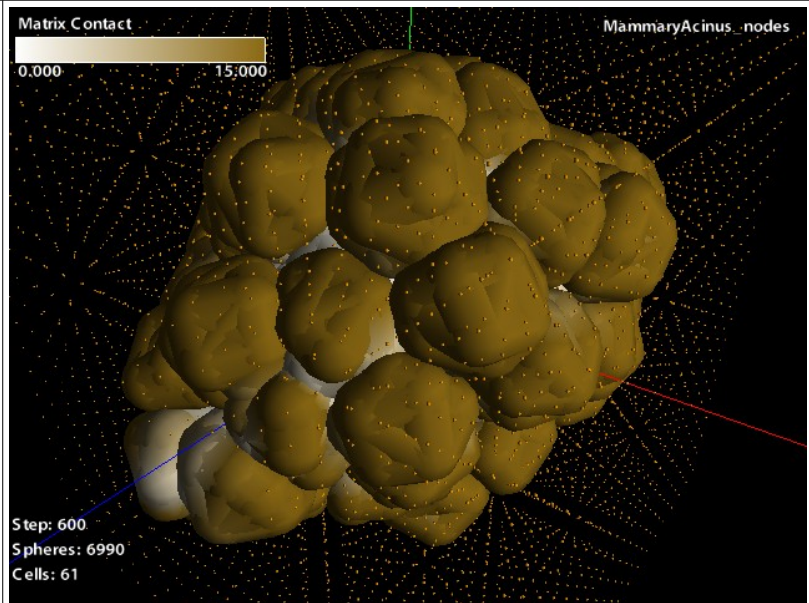
In these images, the acinus has established its polarized shell and only a few internal cells have yet to die.



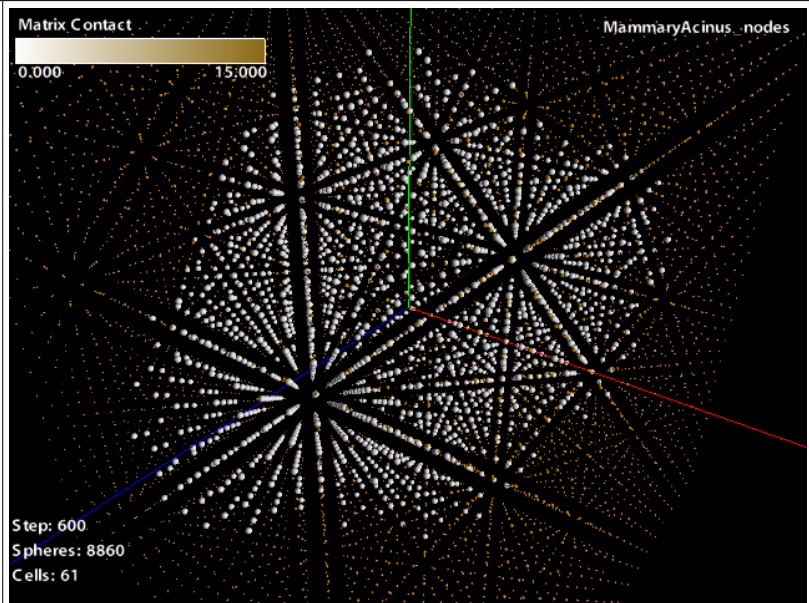
Matrix Contact, cross section



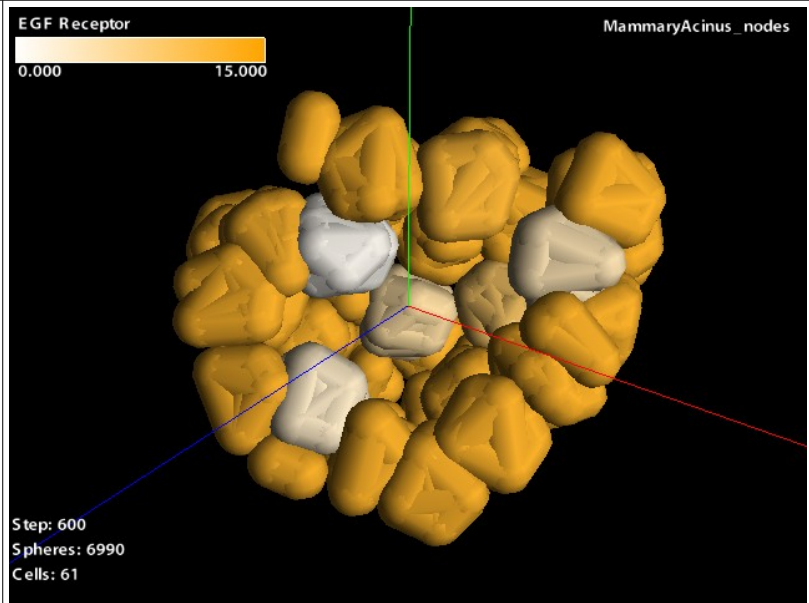
Node grid
orange nodes contain Matrix resource



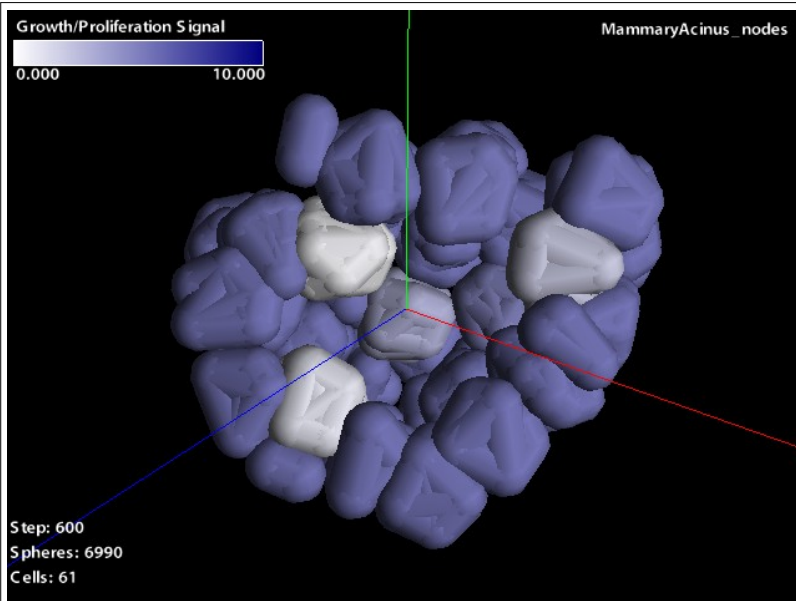
Node grid with cells removed from view
white nodes contain no resources



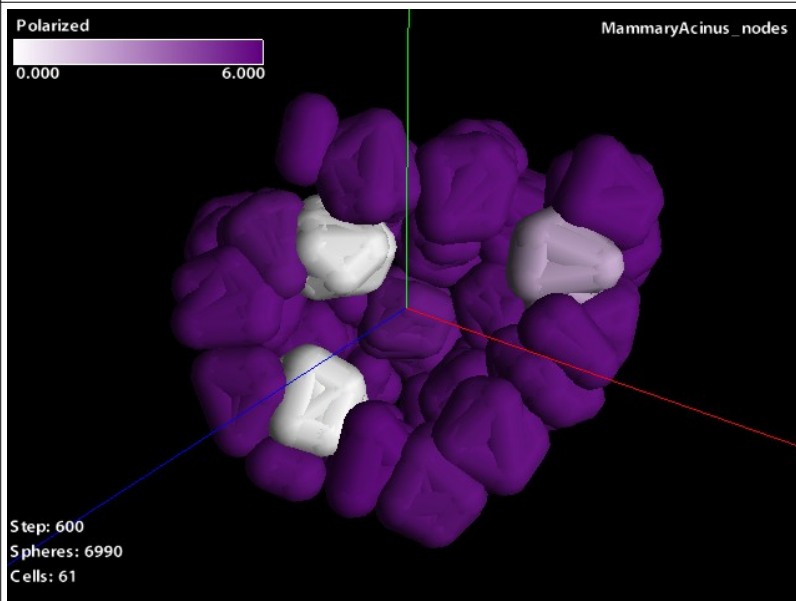
EGFR, cross section
Matrix Contact is required to maintain
EGFR



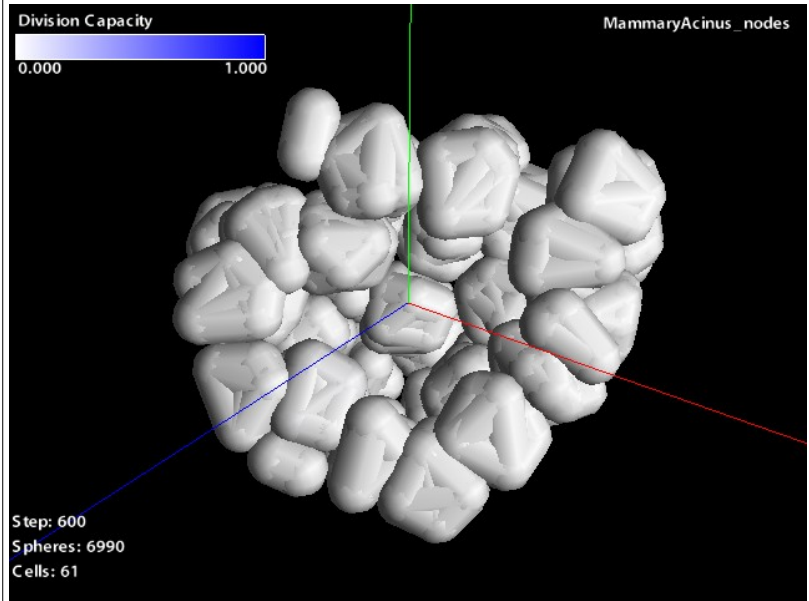
Growth/Proliferation Signal, cross section depends on EGF reception



Polarized, cross section prolonged Matrix Contact leads to polarization and maturation



Division Capacity, cross section polarization and maturation shuts down division pathway



Survival Signal, cross section depends on Matrix Contact

