**APPENDIX**

The relative acoustic impedance (*Q*)of the scatterers in the construct on day *i* is

 (A1)

where *ρi* and *ρ* are the densities of the scatterer and extracellular matrix (ECM), *ci* and c are the speed of sound in the scatterer and ECM respectively. Rewriting the expression for density of the net scatterer,

 (A2)

The density of the net scatterer can also be calculated from its total mass and volume. On any specific developmental time-point of the construct, the net scatterer is considered to be a cell along with any secreted calcium mineral. Thus, the total mass of the net scatterer on day *i* is the sum of the masses of a cell on day 0 and secreted mineral on day *i.*

 (A3)

After rearranging the expression for mass of the mineral secreted by each cell, the total mass of calcium on day *i* can be obtained.

 (A4)

 (A5)

where *Ni* is the total number of cells on day *i* and *Vi* is the volume of the net scatterer on day *i* which is approximately .