# Characterising the elastic and viscoelastic interaction between the cell and its matrix in 3D: because it takes two to salsa dance

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1. Hydrogels can mimic the elastic and viscoelastic properties of the extracellular matrix (ECM) in terms of stiffness and stress relaxation. (This thesis)
2. Architecture, composition, and bonds that form the network dictate hydrogel elasticity and viscoelasticity. (This thesis)
3. Current techniques do not accurately reflect the 3D hydrogel architecture in a swollen state. (This thesis)
4. An increase in a hydrogel's elastic properties is not reciprocated by a decrease in its viscoelasticity. (This thesis)
5. Increased polymer concentration tailors hydrogel elastic and viscoelastic properties but correlates with low cell viability in 3D. (This thesis)
6. Cell-induced alterations to hydrogel stiffness and stress relaxation during 3D culture do not only depend on the polymer type but also are time-dependent. (This thesis)
7. Applying a generalised Maxwell model of viscoelasticity reveals cell-induced changes to their hydrogel microenvironment. (This thesis)
8. Characterising the ECM mechanics *in vitro* deepens our understanding of cell biology, and pathophysiology to benefit and improve hydrogel-based tissue engineering and regenerative medicine design. (This thesis)
9. Science is made up of so many things that appear obvious after they are explained. (Frank Herbert)
10. Let us read, and let us dance; these two amusements will never do any harm to the world. (Voltaire)
11. Everything in the universe has rhythm. Everything dances. (Maya Angelou)