In this talk we study the derivation of kinetic and macroscopic models (PDE) from agent-based models for complex dynamical networks of interconnected particles. The agent-based model features particles (2D spheres) having the ability to link/unlink with its close neighbors by creating springs of given equilibrium length. In the limit of large number of particles, we formally obtain a kinetic system of two equations: one for the distribution function of individual particles and one describing the pairs of linked particles. In the large scale limit and under scaling assumptions, we obtain an aggregation diffusion equation which numerically match the limiting behavior of the particle model. The linear and non-linear stability analysis of the homogeneous states of the macroscopic model enable to identify precise criteria linking the aggregation capacity of the model to few key model parameters. This model is then extended to the two-species case and enable the study of cell segregation and border sharpening in biological systems.