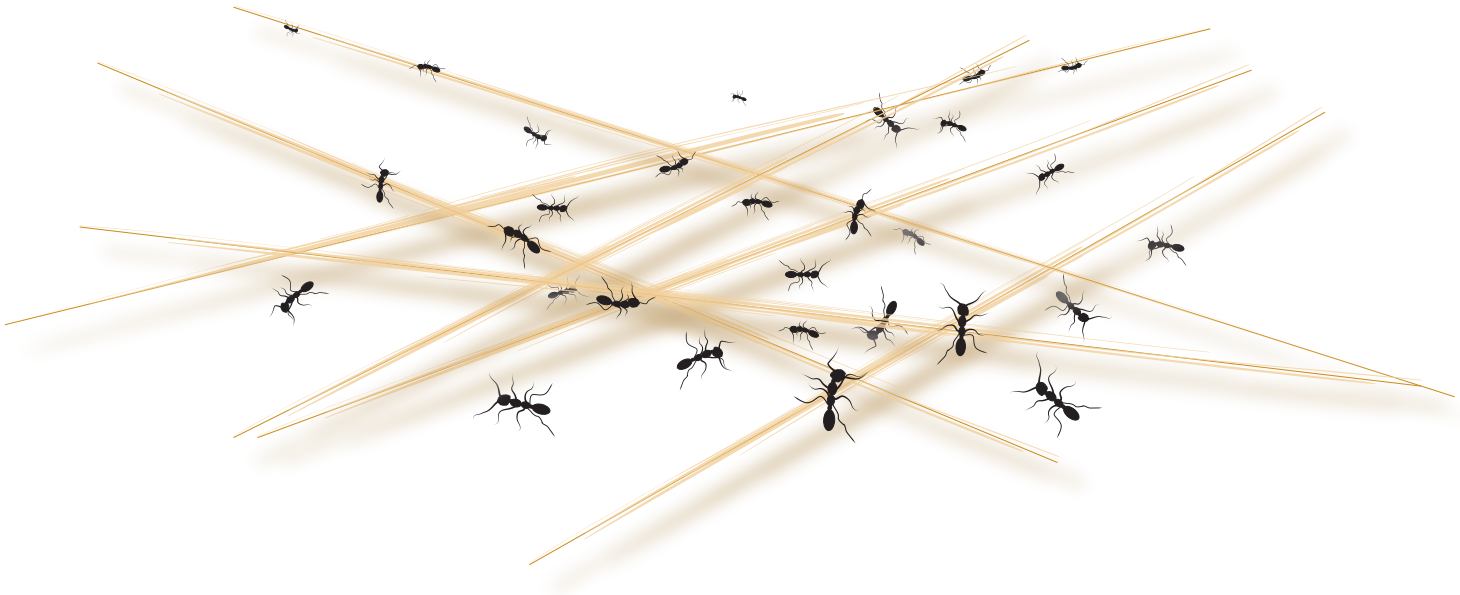

LEGEND:
Restrictions to molecular motion by barriers (membranes) are ubiquitous in porous media, composite materials and biological tissues. It is shown that the long-range structural correlations introduced by the spatially extended permeable barriers give rise to distinct features of the Brownian motion. The power law dispersion of the diffusion coefficient can be used to identify permeable barriers as restrictions to transport, and to quantify their permeability and surface area.