Slip slidin' away

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The flow behaviour of dense hydrogel suspensions displays a range of remarkable features, whose origin is not yet understood. We explore hydrogel packing mechanics via rheology and custom intruder tests. We test both transient and steady state responses via stress and strain control modes. Our findings highlight that with a specific choice of boundary conditions, dense hydrogel packings can behave as quasi-Newtonian fluids. They also display short, strong and reproducible shear history dependence. These results will be discussed in the context of the observed multiple relaxation dynamics in particle-level contact mechanics.