Author Contributions

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Author contributions:

S.S.D., A.P.S., and R.F.I. designed research; S.S.D. and A.P.S. performed research; S.S.D. and A.P.S. contributed new reagents/analytic tools; S.S.D. and A.P.S. analyzed data; and S.S.D., A.P.S., and R.F.I. wrote the paper.

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Detailed contributions from noncorresponding authors:

A.P.S. codesigned all experiments and coanalyzed all experimental results; codeveloped theoretical tools and coperformed the experiments and calculations; performed some of the FC oil measurements and analyzed some of the results in Figs. 1 and S1; performed some of the ex vivo experiments and analyzed some of the results in Figs. 2–4 and S3–S7; codeveloped the theoretical model; cooptimized and coperformed calculations for the theoretical model and coanalyzed results in Fig. 3; performed a sensitivity analysis for the theoretical model shown in Fig. S9; performed dynamic light scattering measurements of polymers and probes; designed and performed GPC measurements in Fig. S10; cowrote the paper.

S.S.D. coplanned the project; codesigned all experiments and coanalyzed all experimental results; codeveloped theoretical tools and coperformed the experiments and calculations; set up polymer-fed animal experiments (Fig. 1); performed some of the FC oil measurements and analyzed some of the results in Figs. 1 and S1; developed the ex vivo experimental approach; performed the ex vivo experiment of WGA-stained mucus (Fig. S2); performed some of the ex vivo experiments and analyzed some of the results in Figs. 2–4 and S3–S7; tested optical properties of test solutions (Fig. S8); codeveloped the theoretical model; developed a computational approach for the theoretical model calculations; cooptimized and coperformed calculations for the theoretical model and coanalyzed results in Fig. 3; developed an approach to extract liquid fraction of murine colonic contents; cowrote the paper.