

## Author Contributions

Asher Preska Steinberg, Sujit S. Datta, Thomas Naragon, Justin C. Rolando, Said R. Bogatyrev, and Rustem F. Ismagilov. **2019**. "High-molecular-weight polymers from dietary fiber drive aggregation of particulates in the murine small intestine." *eLife*. 8:e40387.

### Manuscript

#### Author contributions

Asher Preska Steinberg,  
Conceptualization, Resources, Data curation, Software, Formal analysis, Funding acquisition, Validation, Investigation, Visualization, Methodology, Writing—original draft, Writing—review and editing, Co-designed all experiments and co-analyzed all experimental results; developed theoretical tools and performed all calculations; co-developed imaging analysis pipeline in ImageJ; developed computational tools for bootstrapping procedure; co-developed microscopy assay (Fig 1C-D); Co-performed, designed, and analyzed data from gavage experiments in Fig 1; performed, designed, and analyzed data from all ex vivo SI aggregation experiments in Figs 2, 3, 5-7; performed, designed, and analyzed data from all GPC measurements in Figs 3, 5-7, and Tables 1-7; performed, designed, and analyzed data from all in vitro PEG aggregation experiments in Fig 4D, Fig 4 - supplements 2-3, and with dietary fiber in Fig 7A; developed a computational approach for theoretical calculations in 4H and 4I and performed all calculations; performed, designed, and analyzed data from Western blots in Figs 5E, 6E, Fig 6-supplements 1-2; helped supervise animal husbandry of MUC2KO colony; performed animal husbandry for WT mice on autoclaved diets in Fig 6; performed animal husbandry for mice on pectin and Fibersol-2 diets in Fig 7; performed, designed, and analyzed all zeta potential measurements in Table 8; performed pH measurements on luminal fluid in Fig 4 - supplement 1; co-interpreted results.;

Sujit S Datta,  
Conceptualization, Investigation, Methodology, Writing—review and editing, Conceived and co-planned the project; initially observed the aggregation phenomenon; co-designed and co-analyzed preliminary experiments; performed preliminary ex vivo and in vitro aggregation experiments; co-developed microscopy assay used in Fig 1C and 1D; developed ex vivo/in vitro aggregation assay used in Figs 2-7; co-developed approach to extract liquid fraction of murine intestinal contents; co-developed NMR protocol; organized transfer and initial set up of MUC2KO colony; co-interpreted results.;

Thomas Naragon,  
Data curation, Software, Formal analysis, Methodology, Writing—original draft, Co-developed imaging analysis pipeline in ImageJ; co-analyzed ex vivo aggregation data in Fig 2; co-designed and co-analyzed preliminary ex vivo aggregation experiments with MUC2KO mice; provided useful advice on bootstrapping procedure; co-interpreted results.;

Justin C Rolando,  
Data curation, Formal analysis, Investigation, Methodology, Writing—original draft, Developed protocol for NMR measurements on PEG-coated particles, Performed synthesis of particles, Performed NMR measurements in Table 8;

Said R Bogatyrev,  
Investigation, Methodology, Writing—review and editing, Co-performed preliminary experiments; developed fluorescent laser scanning approach appearing in Fig 1A and 1B; Administered particles to mice in Fig 1; co-developed approach to extract liquid fraction of murine intestinal contents; co-organized transfer and initial set up of MUC2KO colony; setup genotyping of MUC2KO mice; helped supervise animal husbandry of MUC2KO colony; helped with interpretation of results.;

Rustem F Ismagilov,  
Resources, Formal analysis, Supervision, Funding acquisition, Investigation, Methodology, Writing—original draft, Project administration, Writing—review and editing