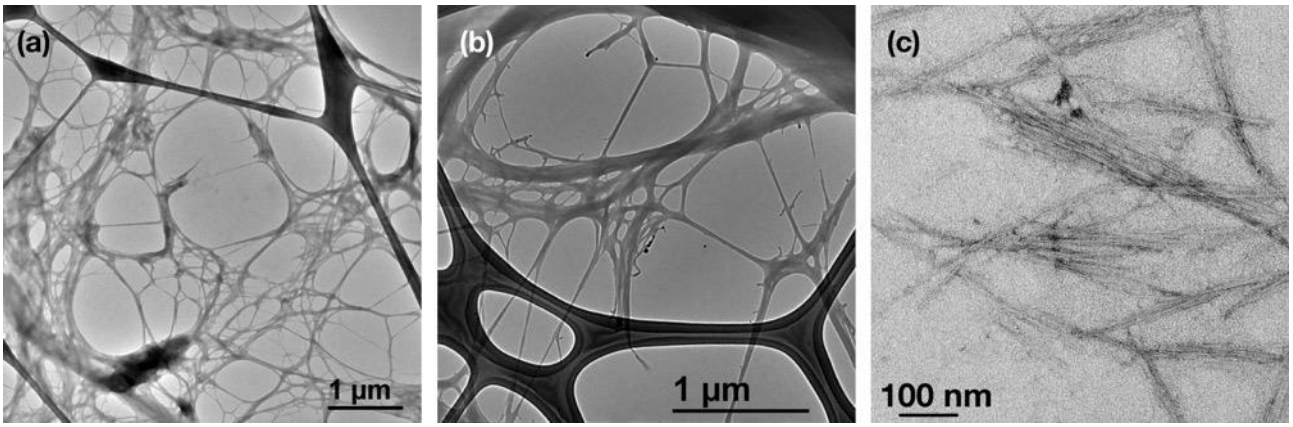
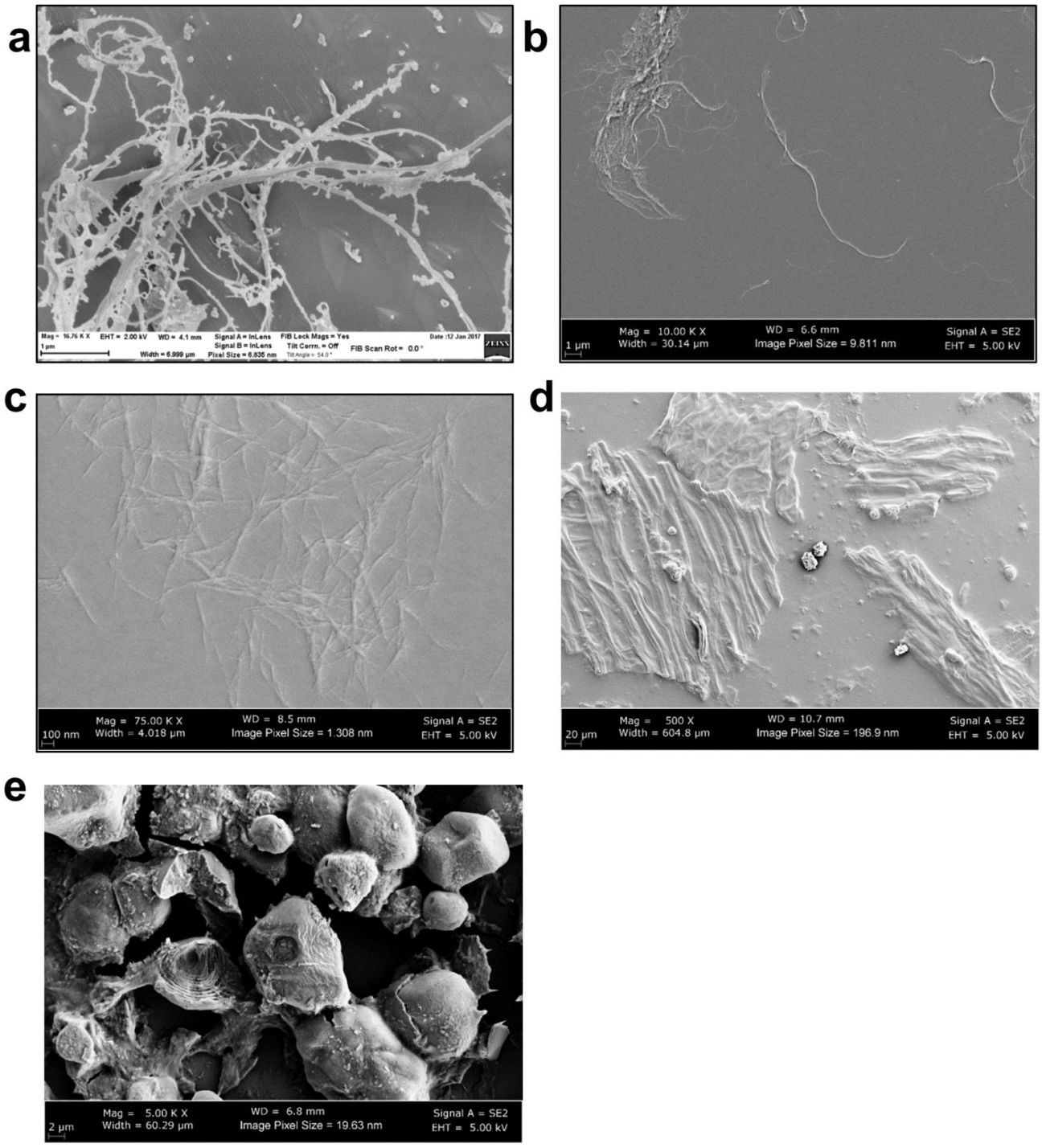
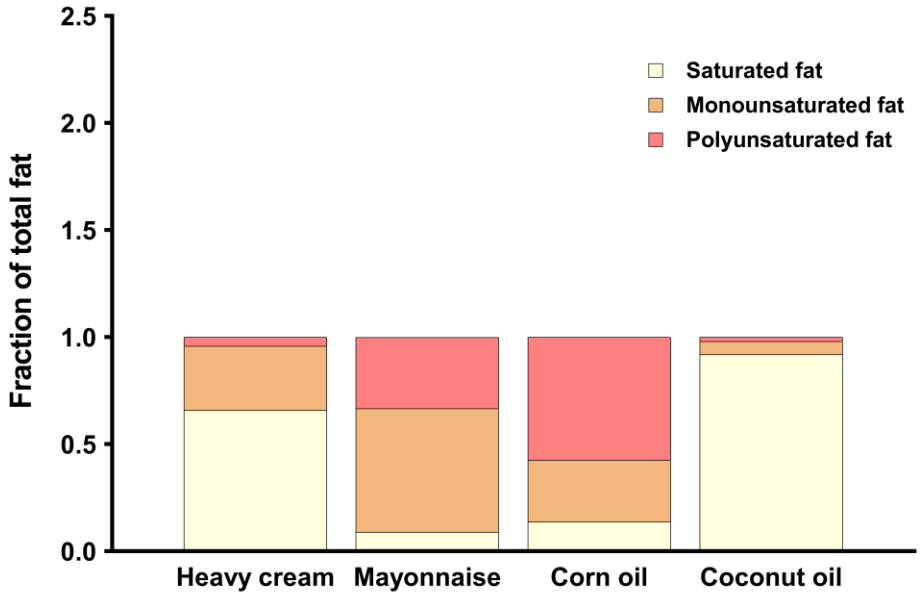
Supplementary Figures:



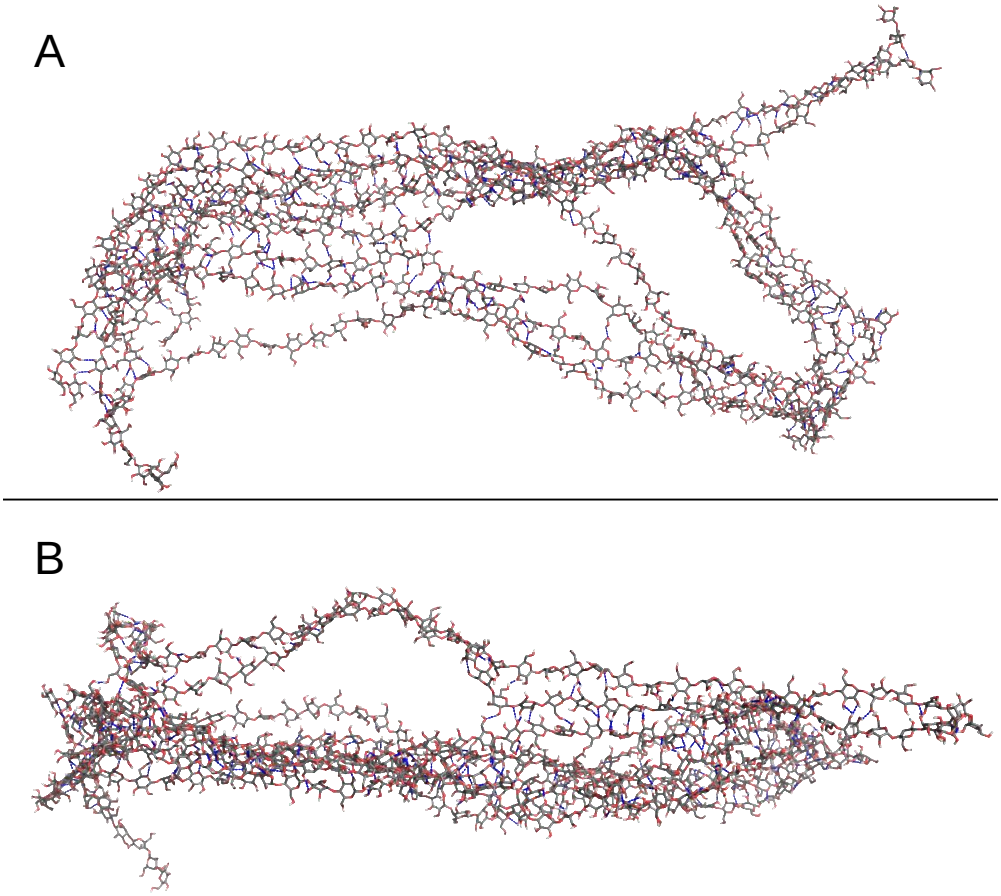
Supplementary Figure 1 | TEM images of nanocellulose materials. a. 50 nm Fibrillar nanocellulose (CNF), b. 80 nm CNF, c. cellulose nanocrystals (CNC).



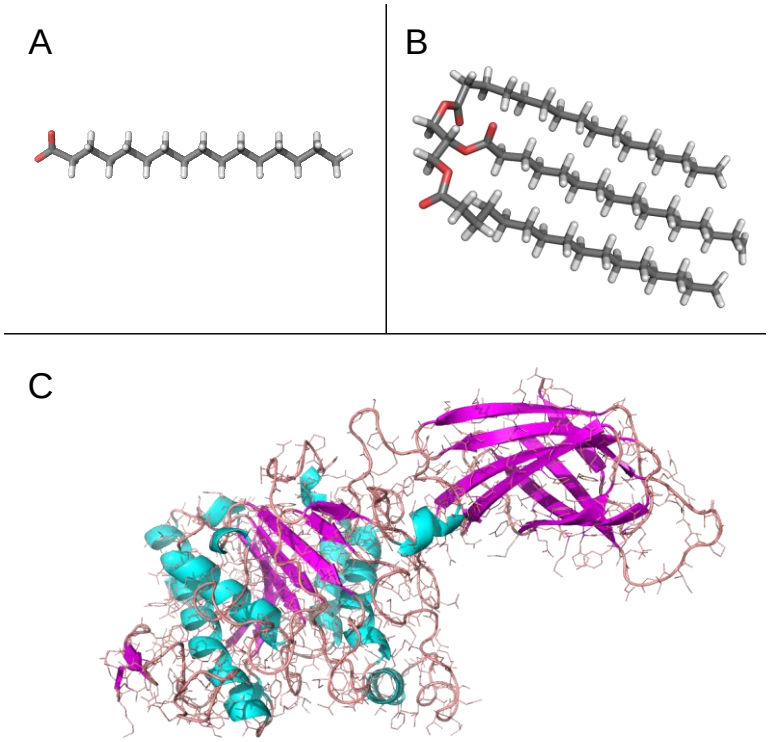
Supplementary Figure 2 | SEM images of fibers studied. a. 50 nm Fibrillar nanocellulose (CNF), b. 80 nm CNF, c. cellulose nanocrystals (CNC), d. Psyllium husk fibers, e. Wheat dextrin fibers.



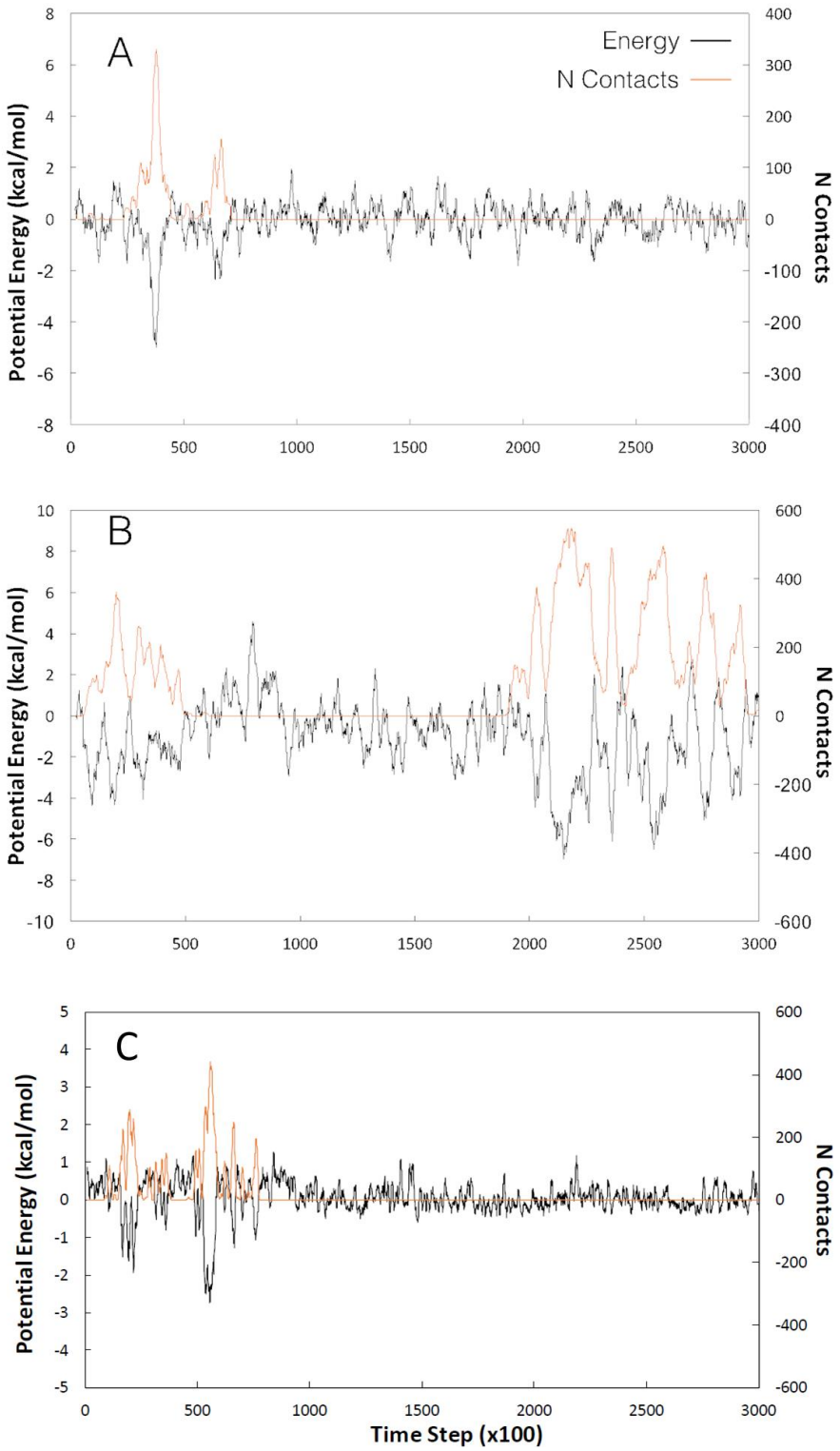
Supplementary Figure 3 |Comparison of saturated, monounsaturated and polyunsaturated fatty acid composition of triglycerides in different food models tested.



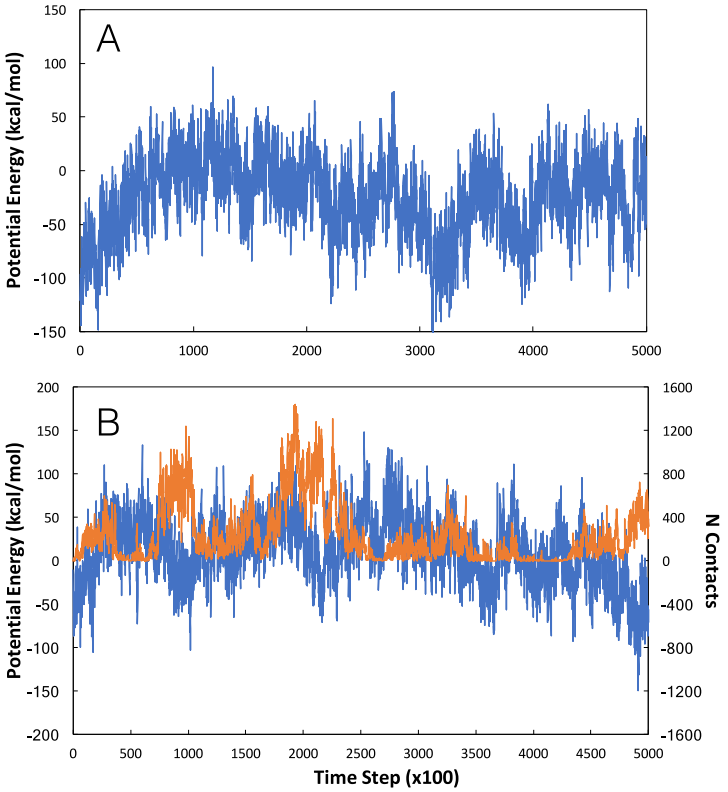
Supplementary Figure 4 | A: Side view of self-assembled cellulose nanofiber. B: Side view of the same fiber. Colors indicate carbon (gray), oxygen (red), and hydrogen (white) as well as hydrogen bonds (blue).



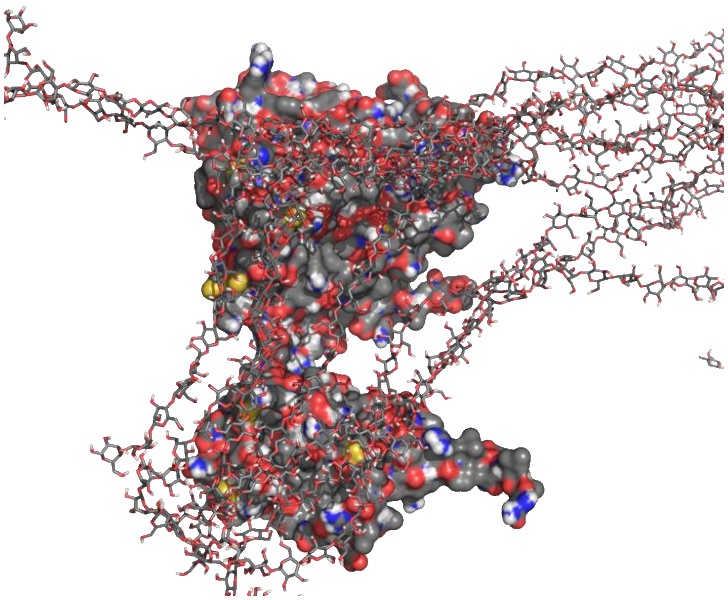
Supplementary Figure 5 | Initial structures for A: Palmitic acid, B: Palmitic Triglyceride, and C: Human pancreatic lipase. Colors indicate carbon (gray), oxygen (red), and hydrogen (white). In C, colors indicate beta sheets (magenta) and alpha helices (cyan).



Supplementary Figure 6 | Number of contacts (orange) and system potential energy (black) for A: free palmitic acid, B: palmitic triglyceride, and C: glycodeoxycholate, over a 300,000 time step excerpt from DMD simulations with a cellulose nanofiber.



Supplementary Figure 7 | Energy-contacts plots from a simulation of A: free pancreatic lipase and B: pancreatic lipase with a cellulose nanofiber



Supplementary Figure 8 |The result of pancreatic lipase interactions with a cellulose nanofiber. For clarity, the enzyme is shown as a continuous surface.