

Figures in Supporting Information

Section I: Disk morphology

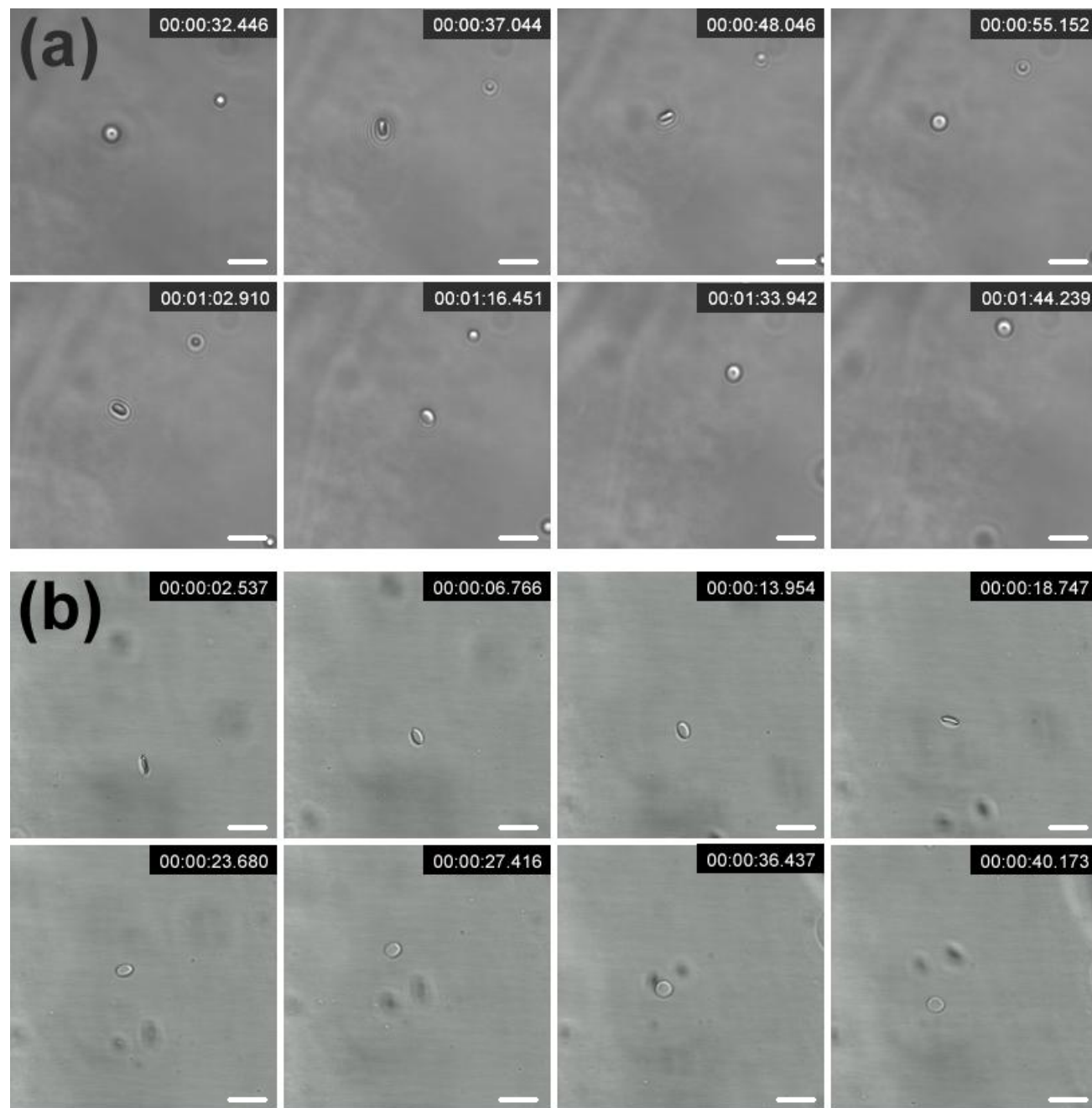


Figure S1. Time sequences of Brownian motions from the supplementary movies. **(a)** Biconcave disk. The dimples on the circular faces can be examined from various view-angles. **(b)** Flat disk. The flat surfaces and the increased aspect ratio compared to the biconcave disk are evident. The scale bars are 8 μm .

Section II. Disk Structure: Focal Conic Domain and $+\pi$ edge disclination.

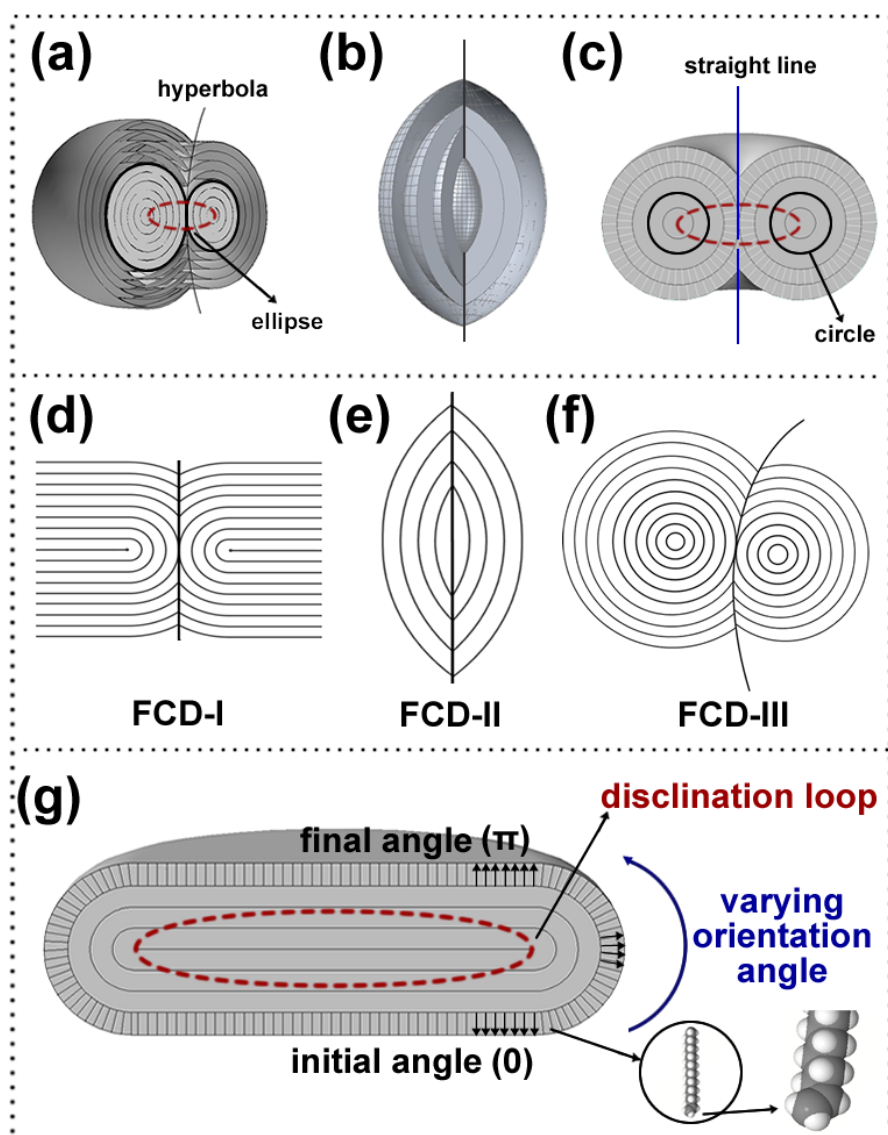


Figure S2. Defects of a layered structure. **(a)** A focal conic domain (FCD) defect with cores as a pair of an ellipse and a hyperbola. FCD is one type of defect typically observed in smectic liquid crystals. The general structure is made up of layers of molecules as illustrated. The α -eicosene molecules in the rotator phase organize into layers where the arranged molecules are perpendicular to the layers. **(b)** 3D structure for FCD-II. **(c)** For the case of a symmetric FCD, the ellipse becomes a circle and the hyperbola becomes a straight line. **(d)** FCD-I, which is formed by cyclides with negative Gaussian curvature (curved part of the drawing). **(e)** FCD-II, which is formed cyclides with positive Gaussian curvature. **(f)** FCD-III, which is formed by cyclides of both positive and negative Gaussian curvature.

(d),(e) and (f) are the cut-views of the defects. For example, (f) is the cut view of (a) as well as (e) for (b). (d) is the central part of (c). (c) is rotationally symmetric about the line, which is drawn straight and can be curved as the hyperbola in (a). **(g)** The $+\pi$ disclination loop. The orientation of the α -eicosene molecules inside the flat disks has a topological defect: disclination loop. One cycling around the core, the integral change of the molecular orientation is π and changing in the same direction as the cycling, so it is called a $+\pi$ disclination loop. The arrays in the layer stand for the orientation of the α -eicosene molecules, which is not symmetric: one end has a c=c bond and the other is a c-c bond.

Section III: Disk Self-assembly

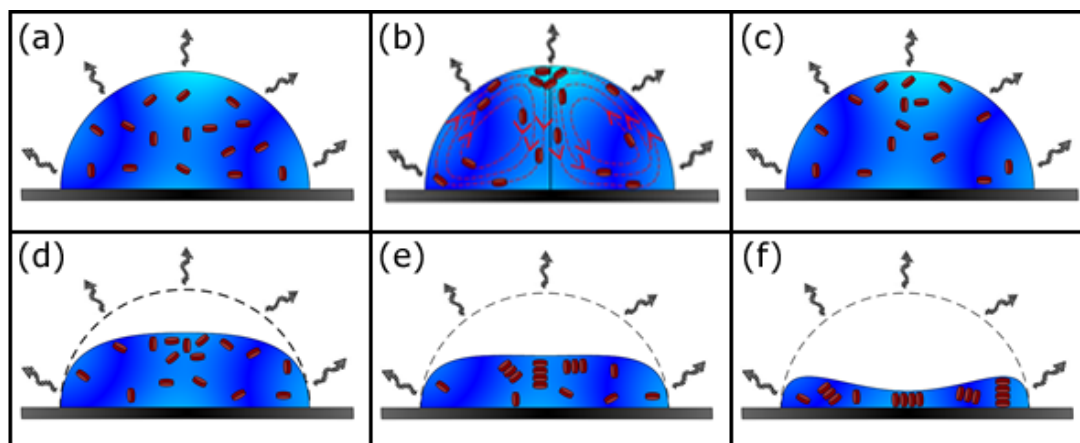


Figure S3. Schematic representation of the self-assembly of disks in an evaporating droplet (side view).