Supporting Information for

Lipid bilayer-mediated spatiotemporal correlation between near-wall confined motion of micro-carriers

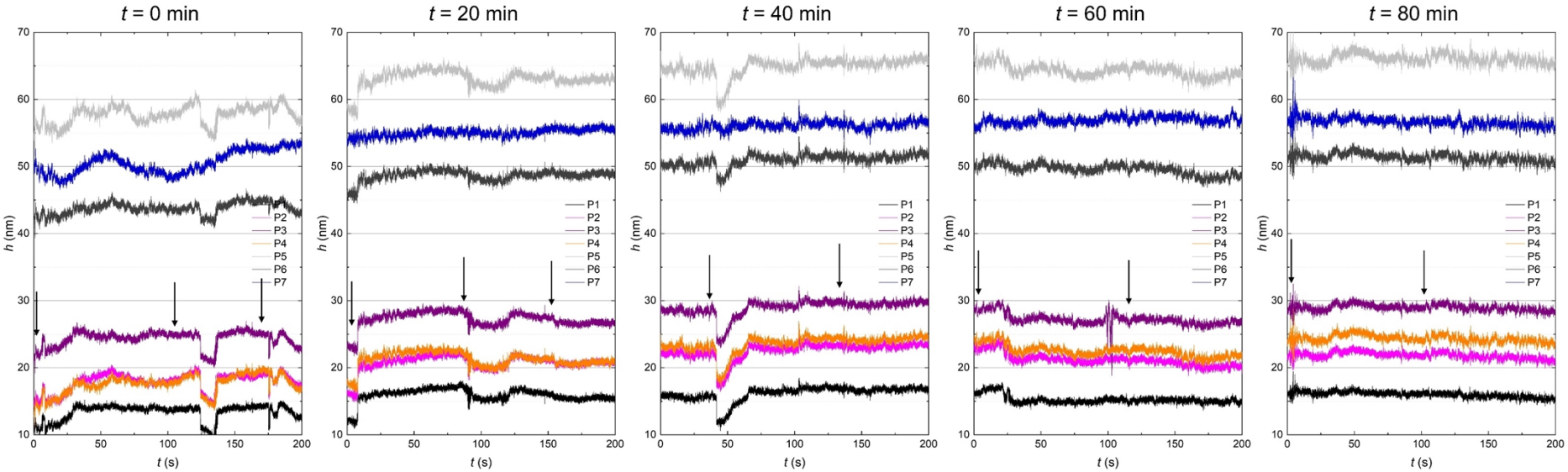
Wei Liu,[a] Jinwei Zhong,[a] Pui Wo Felix Yeung,[b] Xiahui Xiao,[a] Yuwei Zhu*[a] and To Ngai*[b]

[a]The Key Laboratory of Synthetic and Biological Colloids, Ministry of Education & School of Chemical and Material Engineering, Jiangnan University, Wuxi 214122, PR China

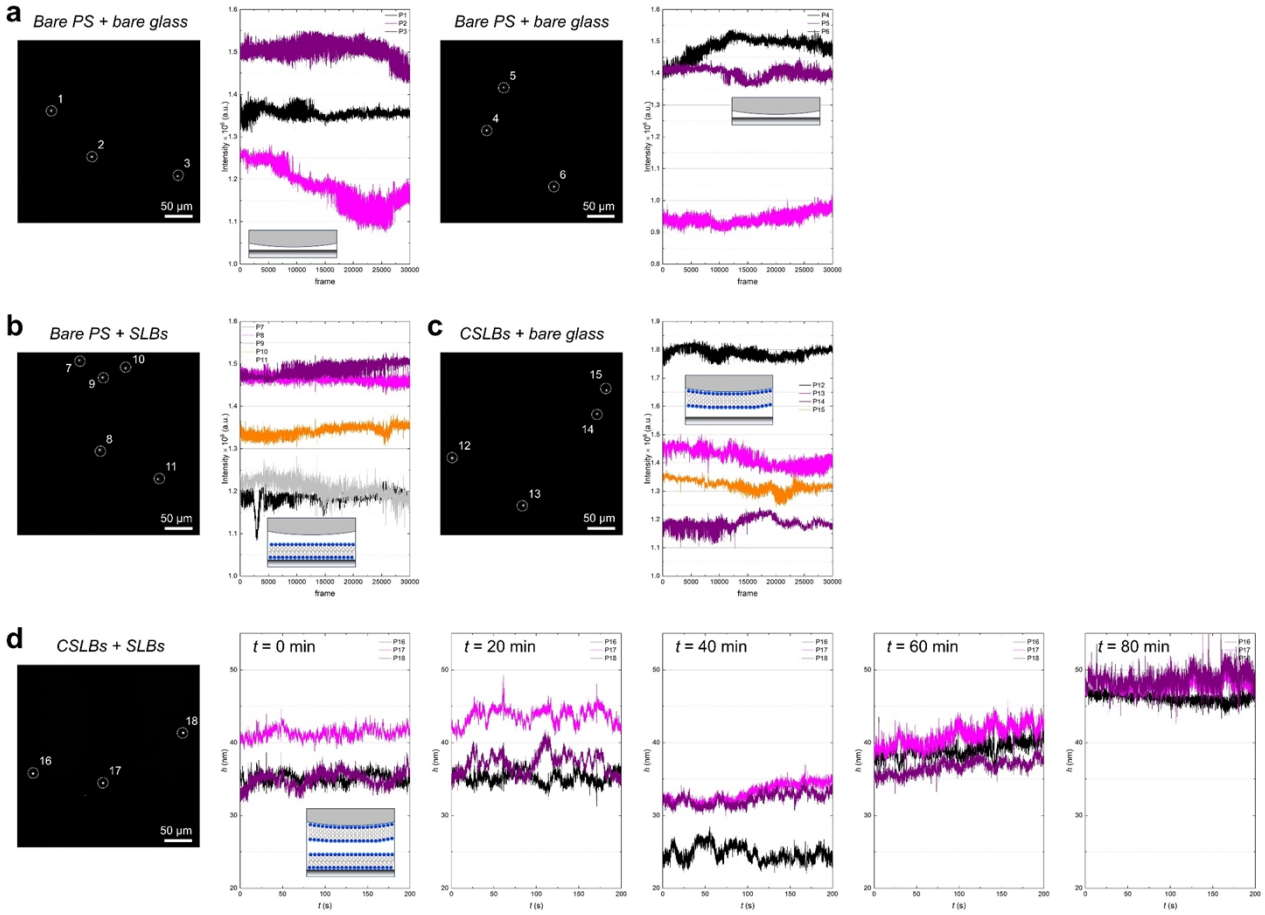
[b]Department of Chemistry, The Chinese University of Hong Kong, Shatin, N.T., Hong Kong 999077, PR China

*Corresponding author: uvyzhu@gmail.com (Y. Z.); tongai@cuhk.edu.hk (T. N.)

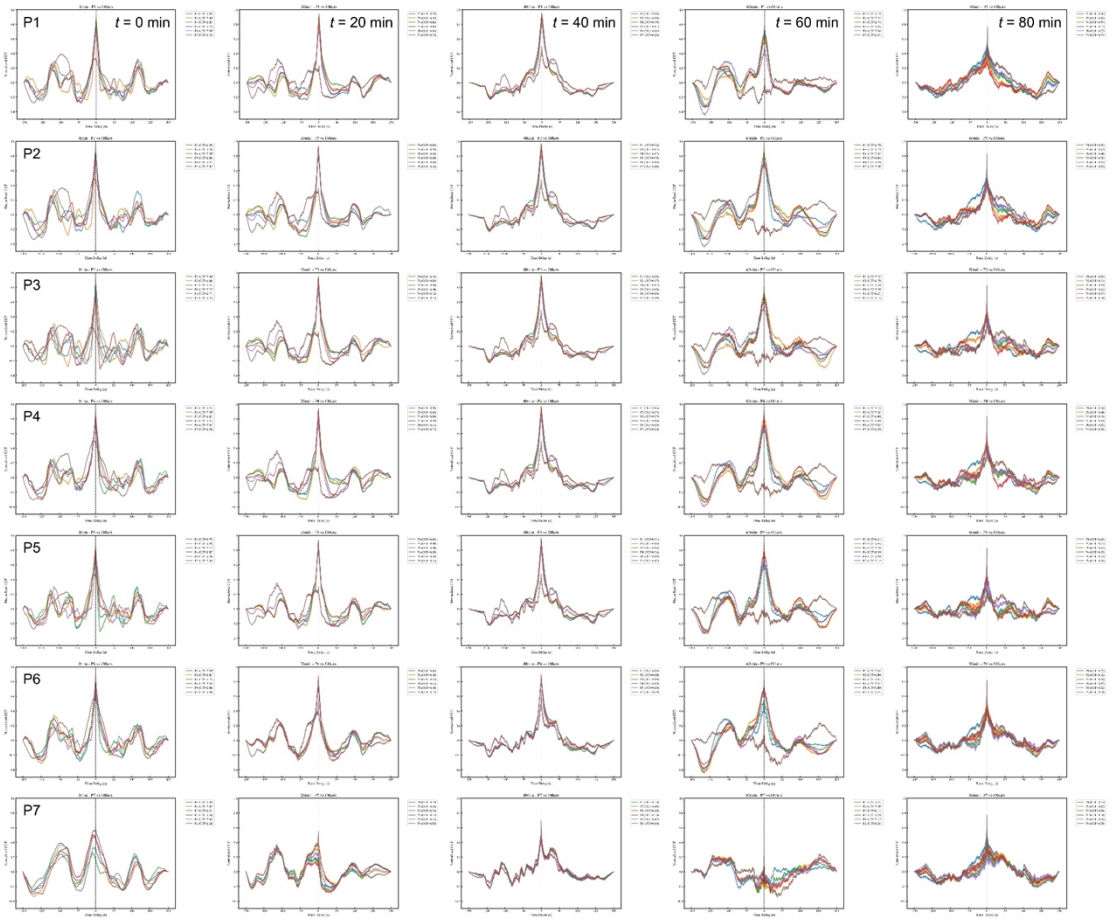
Supplementary Figure S1: Trajectory of the *z*-directional displacements of particles 1–7 (P1–7) at different points in time. Arrows indicate where the mean square displacements are calculated in Fig. S4.



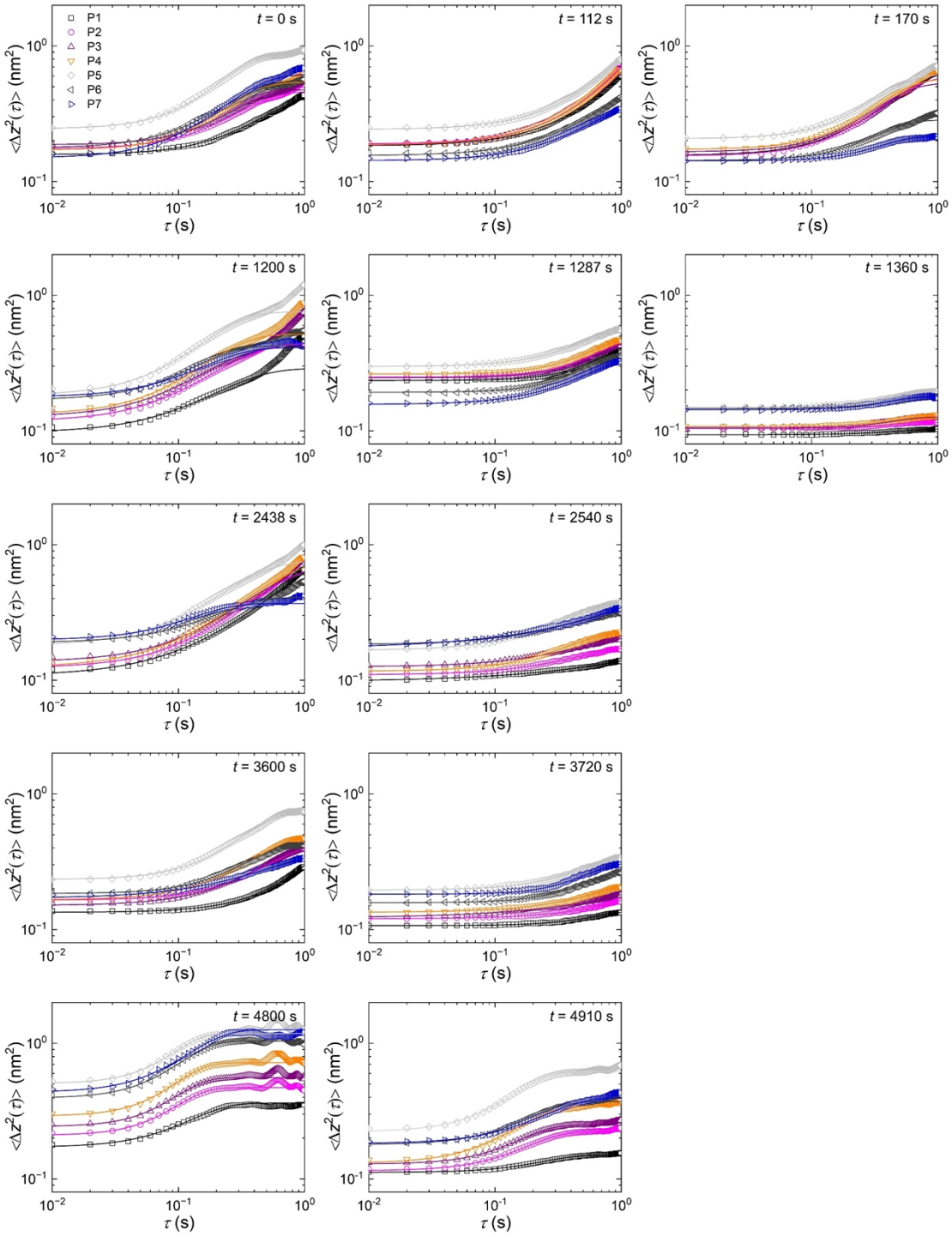
Supplementary Figure S2: Intensity trajectories for bare particles 1–6 on surface of bare glass (a), bare particles 7–11 on supported lipid bilayers (SLBs) (b), lipid bilayer-modified particles 12–15 (CSLBs) on surface of bare glass (c), and height profiles for CSLBs 16–18 on SLBs at various time (d).



Supplementary Figure S3: Normalized cross-correlation functions (CCF) at various time using signals of P1 to P7 (from top to bottom) as the reference, respectively. $t < 0$ represents the negative lag time.



Supplementary Figure S4: Mean squared displacements of microspheres of interest at various time. Solid lines represent the non-linear fitting for corralled diffusion with a relaxed power-law exponent.



Supplementary Figure S5: Time-evolutions of the anomalous diffusion exponent α (a) and corral size z_c (b) for the seven microspheres. (c) Log-log plot of z_c versus diffusion constant D_z. The dotted circle highlights the region of crowded distribution.