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Collective interaction of microscale matters in natural analogy: human cancer cells vs. microspheres SUNGSOOK AHN, SANG JOON LEE, Pohang University of Science and Technology (POSTECH), POSTECH TEAM — Collective behaviors have been considered both in living and lifeless things as a natural phenomenon. During the ordering process, a sudden and spontaneous transition is typically generated between an order and a disorder according to the population density of interacting elements. In a cellular level collective behavior, the cells are distributed in the characteristic patterns according to the population density and the mutual interaction of the individual cells undergo density-dependent diffusive motion. On the other hand, density-controlled surface-modified hollow microsphere suspension induces an overpopulation via buoyancy which provides a driving force to induce an assembly. The collective behaviors of the cells and microspheres in a designed liquid medium are explained in terms of the deviation from the interparticle distance distribution and the induced strength to organize the particle position in a specific distance range. as a result, microscale particulate matters exhibit high resemblance in their pair correlation and dynamical heterogeneity in the intermediate range between a single individual and an agglomerate. Therefore, it is suggested that biological systems are analogically explained to be dominated by physically interactive aspects.

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