Title : An Example of 3D Single-particle tracking in live Bacteria

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Abstract:

Single-particle tracking (SPT) in living cells provides a way to identify a particle's binding state based on how it moves. In present paper, authors track fluorescently labeled ribosomal subunits in bacterial cells. They show that translating ribosomes move much slower than free subunits. More importantly, they show that it is only translating ribosomes that are excluded from the bacterial nucleoid, whereas free subunits have full access to the nucleoid. This finding is important because several gene-regulation mechanisms require that ribosomes are able to initiate translation as soon as the RNA polymerase has initiated transcription, and it has been difficult to reconcile such a requirement with the observation that ribosomes are nucleoid-excluded.

In this Journal Club, I will introduce an example that found by using SPT in cellular live image.

References:

1. Sanamrad, A., Persson, F., Lundius, E.G., Fange, D., Gynnå, A.H., and Elf, J. (2014) Single-particle tracking reveals that free ribosomal subunits are not excluded from the *Escherichia coli* nucleoid. *Proc Natl Acad Sci USA* **111**: 11413–11418.

2. Uphoff S, Reyes-Lamothe R, Garza de Leon F, Sherratt DJ, Kapanidis AN (2013) Singlemolecule DNA repair in live bacteria. Proc Natl Acad Sci USA 110(20):8063–8068.