Updated analytical approaches for multisubunit protein complexes

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Abstract:

In terms of molecular biology, most processes in living systems are a great variety of physiochemical reactions, quite a few of which are mediated by multisubunit protein complexes. So far, however, analytical approaches of large protein complexes have been less flexible due to technological problems, unlike in the case of single molecules. In this Journal Club, I'm going to introduce two, but not related to each other, reports focused on multisubunit protein complexes involved in chromatin dynamics.

One is the paper about a novel –simple, rapid, efficient and fast- method that enable the generation of recombinant complexes [1]. This system is expected to advance structural and functional studies of large protein complexes.

The other is the brief report about the cell biological analysis of vertebrate kinetochores, a macromolecular complex that is assembled on the centromere and mediates the attachment of chromosomes to microtubules of the mitotic or meiotic spindle [2]. In this paper, an unexpected architecture was unveiled by use of 3D super-resolution fluorescence microscopy.

These may become "milestones" of approaches in biochemistry, biophysics and/or cell biology, and I'd like to use this opportunity to discuss near-future analyses of protein complexes.

References:

1. Weissmann F, et al. (2016) biGBac enables rapid gene assembly for the expression of large multisubunit protein complexes. *Proc Natl Acad Sci USA*, 10.1073/pnas.1604935113.

2. Wynne, D.J., and Funabiki, H. (2016). Heterogenous architecture of vertebrate kinetochores revealed by 3D super-resolution fluorescence microscopy. Mol Biol Cell mbc.E16-02-0130.