



Canadian Association  
of Physicists

Association canadienne  
des physiciens et physiciennes

Contribution ID: 2183

Type: Oral (Non-Student) / Orale (non-étudiant(e))

## How molecular crowding controls the spatial organization of biopolymers in a confined space

*Sunday 10 June 2018 09:45 (15 minutes)*

In a crowded space, a long chain molecule can be phase-separated into a condensed state, redistributing the surrounding crowders. Here we discuss how crowding influences the spatial organization of a ring polymer, consisting of two “arms,” in a cylindrical space. In a parameter space of biological relevance, the distributions of monomers and crowders follow a simple relationship: the sum of their volume fractions rescaled by their size remains constant. Beyond a physical picture of molecular crowding it offers, this finding explains a few key features of what has been known about chromosome organization in an *E. coli* cell. For instance, it is consistent with the observation that crowding promotes clustering of transcription-active sites into transcription foci. Finally, crowding is essential for distributing the two arms in the way observed with *E. coli* chromosomes.

**Author:** Prof. HA, Bae-Yeun (University of Waterloo)

**Presenter:** Prof. HA, Bae-Yeun (University of Waterloo)

**Session Classification:** Soft Matter Canada 2018 | Matière molle Canada 2018

**Track Classification:** Soft Matter Canada 2018