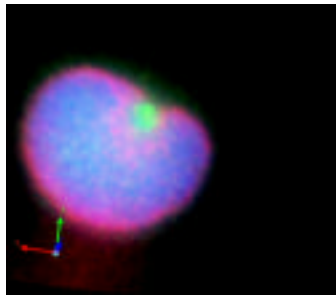
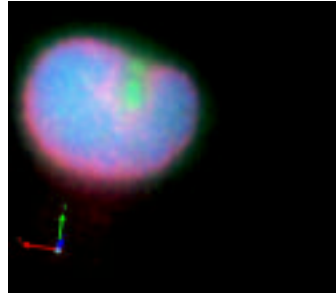




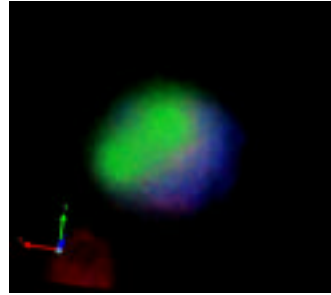
## Molecular dynamics of Aurora-A kinase in living mitotic cells



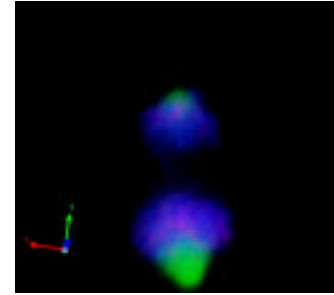
Interphase: centrosomal GFP-Aurora-A dots located in the nucleus cleft well identified by DsRed importin-alpha membrane



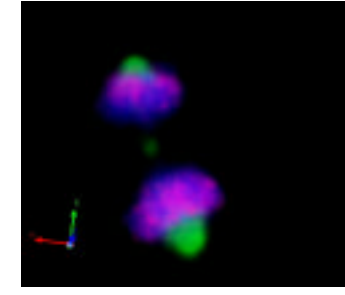
G2 phase: separation of centrosomal Aurora-A dots in the cleft



Prophase: DsRed importin-alpha membrane breakdown, GFP-Aurora-A growth to form a spindle and CFP-chromosome congression



Anaphase: splitting GFP-Aurora-A spindle halves and CFP-sister chromatids segregation



Telophase: DsRed importin-alpha membrane Reformation and reducing GFP-Aurora-A dots

Dr Sugimoto is interested in mitosis and more particularly in a required spindle assembly kinase called Aurora-A. His aim is to determine how the morphology of this centrosomal kinase changes during mitosis in living cells, which could then help identifying potent inhibitors of Aurora-A kinase in the future.

In order to analyse this event, chromatin/chromosomes, centrosomes/spindle and nuclear membrane rim, which is the boundary between cytoplasm and the nucleus, were visualized by expressing histone H3, Aurora-A and a truncated peptide of importin-alpha as fusions to CFP, GFP and DsRed in a human stable cell-line. Using a fluorescent microscope, Dr Sugimoto and his colleagues captured timelapse images every 2 minutes with a 1  $\mu$ m Z step. The acquired images were then directly imported into **Volocity** to generate 3D rendered volumes and to create 2D movies viewed from a specific angle.

The movie shows that during membrane breakdown, Aurora-A is located in the nucleus cleft and grows rapidly. Then, Aurora-A transforms into a spindle-like structure and this event coincides with chromosome congression and segregation. Also, Aurora-A associates with the kinetochore spindle throughout mitosis and finally returns to centrosomal dots after nuclear membrane reformation. **Volocity Visualization** is a powerful tool that allowed the researchers to view the morphological changes in Aurora-A during mitosis from any angle of particular interest. 3D movies can also easily be created from Z stacks captured over time with the **Movie Sequencer** in **Volocity**.