

Effects of Taxol on intracellular transport studied by single particle tracking

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Single particle tracking (SPT) in live cells has been used to study the diffusion of receptors on the membrane, the physical properties of the cytoplasm and the dynamics of molecular motors both in vitro and in the cell. In this work we use a previously characterized molecular motor to study modifications on the cytoskeletal filaments.

We tagged (previously characterized) recombinant Kinesin I with quantum dots, inserted them in the cell and observed their movements. An automatic multi-particle tracking algorithm was used and an unsupervised classification of the trajectories allowed investigation of the differences introduced by a drug. We focused on the effect of Taxol, a drug that stabilizes microtubules and is widely used in chemotherapy.

We present the first results on the distribution changes of speed and processivity introduced by the drug and otherwise non detectable by immunofluorescence or by a non-SPT approach.