

**TITAN SOFTWARE:
A TOOL BOX FOR ADVANCED ANALYSIS IN FLIM**

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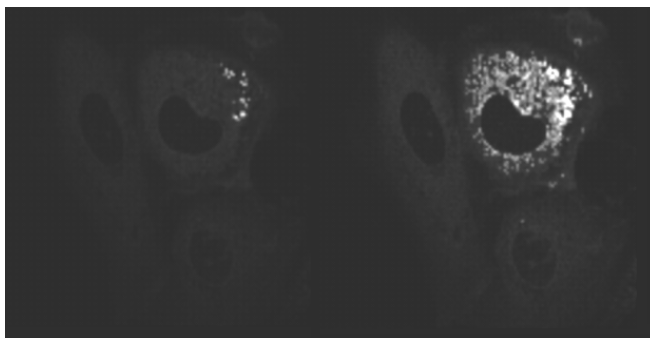
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Today, the measurements of dynamics and interactions between biomolecules in living cells or tissues are a major question in biological research and for new therapeutic targeting (cancer, neuro-degeneration, multifactor diseases...). However, the complexity and the dynamics of the whole molecule interactions events in cells lay down to develop new strategies by coupling several microscopy techniques, and take advantage of several photon properties. Therefore, we have developed, TITAN software, which compared as a tool box, integrates several scientific domains, such as Mathematics, Biology, Physics and more...

One example is to compensate for low photons problem occurred with FLIM image acquisition (Figure 1). To have a correct decay curve fit we must have $10.E^3$ photons at least, but it is lead to a characteristic stress in living cell. So, we have used a very famous algorithm as bootstrap [1]. This technique correlated with Signal Noise Ratio was assessed with simulated and true FLIM measurement data sets from RhB, Rh6g, and eGFP, either in solution or in living cells. The altered Bootstrap for FLIM shows a good efficiency and permits a reduction of time acquisition for FLIM image by 4 times, and so avoid a certain stress in living cell during FLIM acquisition.



Figures 1: Low photons problem (left) offset by bootstrap (right)

[1] Patrick L.T.M Frederix and Evert L. de Beer; and Collaborators, "Dynamic Monte Carlo simulations to model FRET and photobleaching in systems with multiple donor-acceptor interactions" *J.Phys. Chemical*, (2002).