JACoP v2.0: improving the user experience with co-localization studies

Abstract:

“Are my two proteins of interest at the same location?” Here is a question regularly asked… but rarely answered with precision. While the cell biologist expects a binary answer, we however can't give a better answer than “considering the current resolution, we can't exclude that both protein actually are at the same location”. This statement, might particularly be emphasized when considering the evolutions of light microscopy. As an example, one might consider the recent work by Shroff et al (2007, see figure 4C and D) where PALM (PhotoActivated Localization Microscopy) has been used to overcome the diffraction limit encountered with regular microscopies such as wide field, confocal or TIRF microscopies. Their work proved that by pushing downward the resolution, originally co-localizing proteins appeared to be well apart one from the other. Co-localization studies might therefore always be considered relative to a resolution which has to be explicitly stated.

While setting the referential is an easy step to go through, the means to achieve the co-localization studies are to date not so well known. This is mainly due to the widespread of generalist tools lacking warning on their application domains and their limits. In our previous work (Bolte and Cordelières 2006) we wanted to shed light on the means to achieved co-localization studies and introduced two ImageJ plugins, JACoP (Just Another Co-localization Plugin) and 3D object counter, as tools providing the users with means to test and use a wider range of methods. We knew this field to be highly controversial (see Adler and Parmryd 2007, and Bolte and Cordelières 2007) and therefore have been putting effort in explaining alternative methodologies and simplifying JACoP to make it a more user friendly plugin. In particular, its interface has been rethought and the plugin is now totally macro recordable. In this communication we introduce the second version of JACoP and remind the reader the field of application of the methods, concluding with a suggested decision tree.

Keywords:
Co-localization, ImageJ, image analysis, fluorescence microscopy

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Short Biography

EDUCATION:

1998 : Student trainee, ERASMUS Fellow in Dr Viki Allan’s laboratory School of biological of biochemistry, University of Manchester, UK.

1999 : Master degree in Molecular Biology of the Cell. Paris-Sud University (Paris XI), France.

2003 : PhD in Molecular Biology of the Cell. Paris-Sud University (Paris XI), France. Title: What function for CLIP-170 ? Looking for partners and new investigation tools. (Thesis advisor: Pr Jan De Mey).

Since 2003 : Research engineer CNRS., Head of Curie Institute (Orsay) imaging facility.

COMPETENCES

Cell biology, microscopies, image processing and analysis

SCIENTIFIC WORK

My work aims providing the facility users with easy to use tools for advanced image processing and analysis.