LOCALIZATION LIGHT EMITTING MOLECULES OF UNKNOWN ORIENTATION

Ref-Nr: TA-P-899

HINTERGRUND

Many light emitting entities routinely used, in cell biological settings show a dipole orientation. If the exact z position of the light emitting entity is unknown, using simple two-dimensional Gaussian fit algorithms to the light intensity distribution of a range of emitted light, may lead to calculation errors of the x- and y-position of several 10nm. The invention discloses a method for calculation of the exact spatial position and orientation of a light emitting in a sample.

The method has been verified experimentally as well as theoretically (see reference below).

LÖSUNG

First the virtual x- and y-positions and of a light emitting entity are determined for several plans parallel to the focus plan. Thereafter the absolute and/or relative total or peak emitted light intensities in the images of the marker entity are accounted for in determining the z-position and spatial orientation of the marker (see figure).
The figure shows the peak emitted light intensity $I(z)$ and the relative x- and y-position of a dipole in images depending on the z-position of the focal plane. The exact spatial orientation of the light emitting entity can be calculated using all these information.

**VORTEILE**

- Fluorescence super-resolution
- Single molecule localization accuracy

**ANWENDUNGSBEREICHE**

DKFZ is looking for a licensee for further development and commercialisation this technology for samples in high resolution microscopes particularly FPALM, PALM, STORM and PALMIRA.

**PUBLIKATIONEN & VERWEISE**
