

## FLUORESCENCE APPLICATION IN CELLULAR LOCALIZATIONS

Hee Chol Kang

*Molecular Probes, Inc., 4849 Pitchford Ave, Eugene, Oregon 97402, U.S.A.*

Fluorescence is one of the fastest growing and most powerful techniques in biology and medicine mainly due to its noninvasive character, high sensitivity and availability of fluorescence imaging techniques. In particular, the integration of fluorescence imaging into present computer processing and video systems has opened new horizons for fluorescence technique in both biological and medical research and in clinical applications. First, the basic principles on which fluorescent probes work will be briefly reviewed. Next, a number of new fluorescent probes for imaging applications will be introduced. These applications are of particular utility for site-selective labeling of live cells and for subsequent fixation and detection by fluorescence techniques. Some of the examples will show labeled organelles, such as golgi apparatus, mitochondria and lysosomes; other examples show cytoskeletal structure, such as tubulin and actin filaments. Finally, a recently developed fluorescence photooxidation technique will be discussed. This technique makes it possible to get precise correlative immunolocalization on the same sample by the combination of fluorescence, transmitted light and electron microscopy. The advantages of this technique over gold or enzyme based procedures will be demonstrated using the fluorescent probe, eosin. In summary, innovation in fluorescence technology coupled with the development of better fluorescent probes will expand the researchers' understanding of a wide variety of biological, medical and biochemical processes at the cellular and molecular level.