Ultra-sensitive fluorescence analysis for the in situ monitoring of biological events

Fluorescent imaging enables the analysis of many biological binding events on a variety of surfaces. Current methods, however, suffer from high background interference, low fluorescence generation and undefined surfaces. This technology is a two-step method for improving the capabilities of fluorescence interference contrast microscopy via the production of highly controlled nano-engineered surfaces and developed algorithm for extracting signal from a 2D image. These surfaces are comprised of defined layers of functional polymer at variable thicknesses. The high precision in surface synthesis and characterization leads to very high quality imaging results suitable for biological studies.

Well-defined surface engineering and lock algorithm lead to improved image accuracy and signal-to-noise ratio

This technology achieves the difficult task of detecting sensitive biological events such as protein surface binding and single-molecule DNA interactions. Previous technologies suffered from sensitivity due to irregularities in the binding surface. This technology uses chemical vapor deposition to accurately nano-pattern surfaces using tailor functional polymers. Well-defined thickness leads to fluorescent image enhancement and background noise reduction. This technology also uses an algorithm for lock amplification of the image. This leads to improved signal-to-noise ratio and enables real-time monitoring of complex biological processes.

Lead Inventor:

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Applications:

- In-situ monitoring of binding for DNA, proteins and antibodies
- Synthesis of well-defined polymer surfaces of known thickness
- Fluorescent image signal enhancement
• Authentication of documents and images

**Advantages:**

• Ultra-sensitive detection of biological binding  
• Real-time monitoring of events  
• Highly-defined surfaces leads to improvements in signal-to-noise ratio

**Patent Information:**

Patent Pending  
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**Related Publications:**


**Inventors**

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