OLISA™ Micro-arrays: a Flexible and Competitive Method for Rapid Analysis in Gene Expression Profiling

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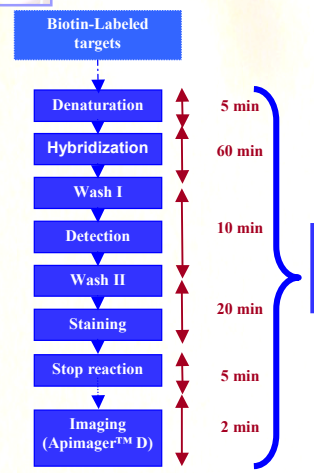
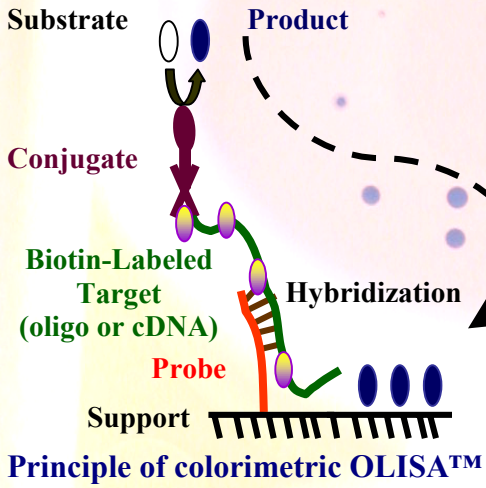
A new versatile oligonucleotide micro-array (OLISA™: OLIgo Sorbent Arrays) has been developed by Apibio to simultaneously monitor up to 1572 different genes. This technology uses the 96-well microtiter plate as a platform in which up to 17 different probes can be attached to the bottom of each well. Therefore, OLISA™ technology permits a high throughput multidetection assay. Using synthetic biotin-labeled targets (50-70 mers), OLISA™ was shown to detect a low number of targets (<10^7 copies per assay) with a dynamic range of 2.5 logs. Both low and high copy number messenger RNAs were detected from 0.2 µg of total RNA per array, as demonstrated on a referenced biological model for cadmium toxicity using yeast cells.

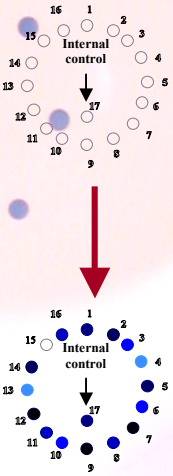
Principle, Material and Methods

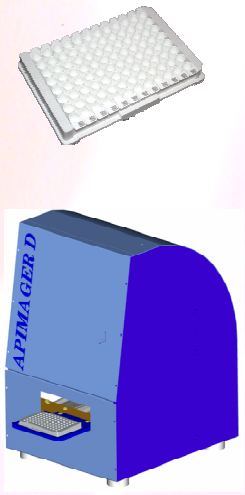


OLISA™ protocol



Principle of colorimetric OLISA™





Imaging system (Apimager™)

Results

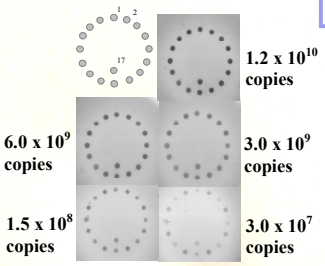


Fig. 1: Imaging performance of hybridized biotin-labeled synthetic 50-mer targets (*act*: even, *seo*: odd).

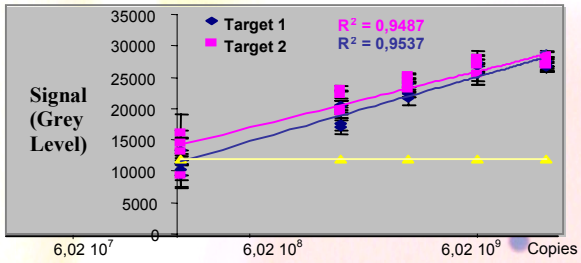


Fig. 2: Dynamic range of OLISA™ Colorimetric assay (> 2 logs).

Sensitivity: 10^7 copies per assay

Reproducibility: Coefficients of variations are lower than 10%

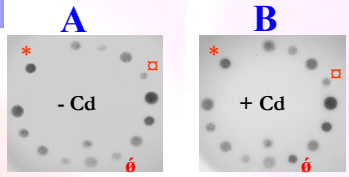


Fig 3: Gene expression profiling in yeast cells. Simultaneous detection of highly represented mRNA (*yef* > 20 copies / cell)* and rare mRNA (*seo* ~ 0.1 copy / cell)¤ from 0.2 µg of total RNA. In contrast of the 4-fold down-regulated *yef* * gene, *ynl* ó and *seo*¤ genes are 4 and 5-fold, respectively, up-regulated by the cadmium.

Conclusion

OLISA™ based on 96-well microtiter plate is a flexible and efficient technology that allows in a short time to simultaneously monitor the gene expression profiling for up to 17 different genes per well. Besides its flexibility, OLISA™ technology based on colorimetric essay has major advantages:

a). A convenient format on a laboratory standard format that easily can fit most of existing instruments.

b). A high sensitivity and a large dynamic range that allow to analyze simultaneously different expressed genes from a small sample.

c). A standardized protocol which can be used in relevant domains such as gene expression profiling, drug screening, toxicology and therapeutic monitoring.

d). A proprietary densitometry reading system and analysis software.

e). A cost-competitive DNA chip technology compatible with high-throughput requirements.

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