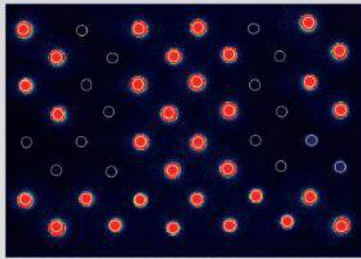




# EUROArray

**DNA microarray test systems for  
molecular diagnostics (IVD)**

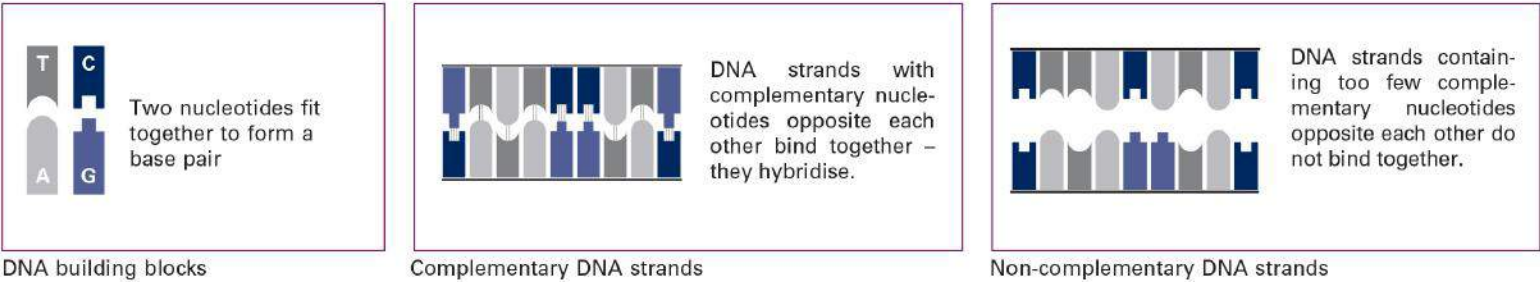


- Multiplex analyses using EUROArray technology
- Simple test performance with ready-to-use reagents
- High result security due to various integrated controls
- Direct use of EDTA blood with EUROArray Direct: no separate DNA isolation required
- Fully automated standardised evaluation
- LIMS connection available

# What is a microarray and how does it work?

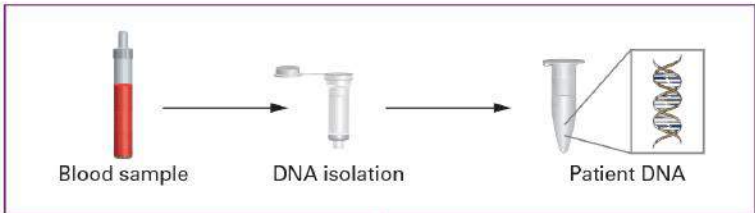
## Principle of a DNA microarray

DNA microarrays consist of DNA molecules (probes) which are applied to a solid carrier material, such as glass, as microscopically small spots located at defined positions. The probes differ from one another by their DNA sequence – the order of their building blocks (nucleotides with the bases adenine, A; cytosine, C; guanine, G; thymine, T). When the DNA of a patient contains segments that match the microarray probes, the complementary DNA regions bind together – they hybridise. This binding is measured via a computer-aided reading and evaluated as a positive signal.



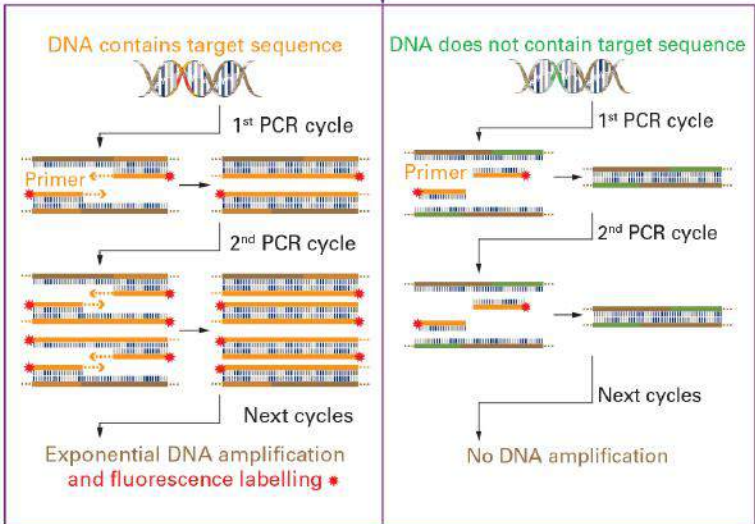
## Sample preparation: DNA isolation

In order to investigate with a microarray if a patient's DNA contains particular sequences, the DNA must first be extracted from the patient's blood. This is performed, for example, using DNA isolation kits.



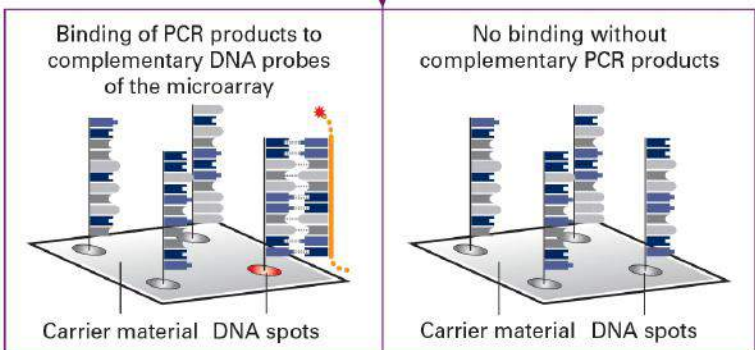
## Amplification of patient DNA: polymerase chain reaction (PCR)

The sections of DNA to be investigated are amplified million-fold using the **polymerase chain reaction (PCR)**. Two starter DNA molecules (primers) define the region to be copied. If the patient DNA contains the corresponding section (target sequence), the primers bind and the target sequence is copied. This reaction is repeated many times, so that the DNA region between the primers is greatly (exponentially) amplified. The resulting PCR products are labelled with a fluorescent dye, which enables them to be detected subsequently by the microarray. If the target sequence is not present in the patient sample, then the primers cannot bind and the DNA is not amplified.



## Analysis of PCR products on the microarray: DNA microarray hybridisation

The PCR products are incubated with the microarray. They are first mixed with a hybridisation buffer, which provides optimal conditions for binding of the PCR products to the complementary probes on the microarray. This binding is measured via the fluorescence signals emitted by the spots.

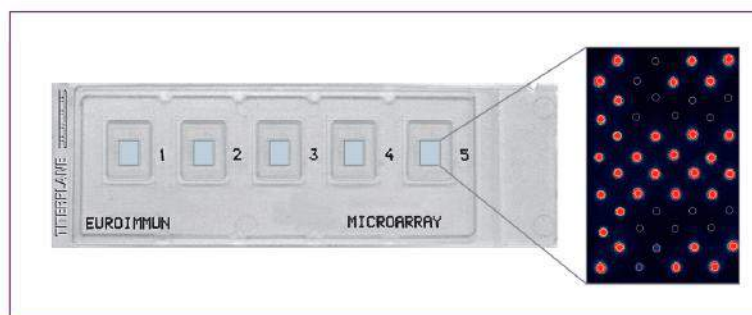




# Microarrays from EUROIMMUN for simple and reliable diagnostics

## EUROArrays in IVD quality

EUROIMMUN microarrays are based on **BIOCHIP Technology**. They consist of numerous single-stranded DNA probes with different sequences, which are applied to thin glass at defined positions. Each BIOCHIP consists of up to 72 DNA spots and allows duplicate determinations of up to 36 different DNA sequences, including controls. Through the combination of several BIOCHIPS in a reaction field, the number of DNA sequences detected can be increased further. Each EUROArray slide contains five test fields, enabling up to five samples to be analysed in parallel.

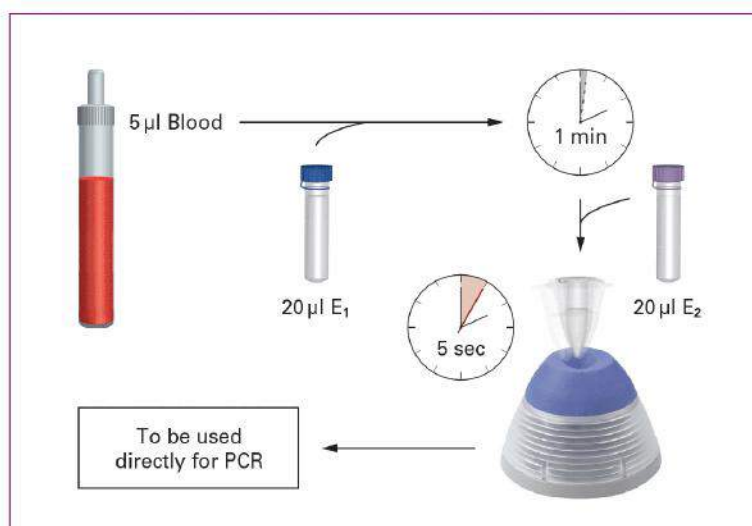


EUROArray slide and enlargement of a BIOCHIP

## Save time and money with the "EUROArray Direct" procedure

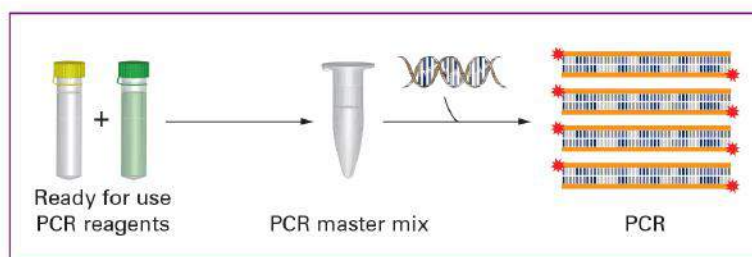
For some parameters EUROIMMUN offers a rapid procedure in which DNA isolation is not necessary. The blood sample is incubated with extraction solution provided in the kit ( $E_1$  and  $E_2$ , see figure). The DNA extract is used directly in the PCR.

Comparison	EUROArray	EUROArray Direct
Blood volume	~200 $\mu$ l	5 $\mu$ l
Time	DNA isolation: approx. 80 min for 40 samples	DNA extraction: < 20 min for 40 samples
Costs	For DNA isolation kit	No additional costs, extraction solutions contained in kit

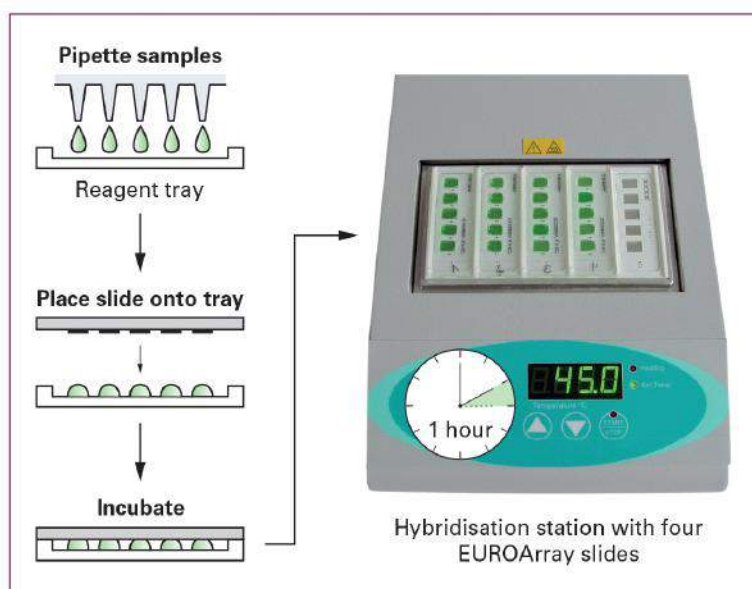


## Simple, uncomplicated and effortless

**All PCR reagents** supplied in EUROArray kits are **ready for use**, including the DNA polymerase and the validated specific primers. Thus, the number of pipetting steps is reduced to a minimum and laborious optimisation processes are eliminated. The PCR works reliably with minimal effort: the pre-prepared PCR reagents are simply combined, and the DNA is then added to this master mix.



The DNA microarray hybridisation is performed under exact, standardised conditions using the proven **TITERPLANE Technique**. This procedure is simple and reliable. The samples (PCR products + hybridisation buffer) are pipetted onto the reaction fields of a reagent tray. The slides are then placed into the recesses of the reagent tray, whereby all BIOCHIPS come into contact with the liquids simultaneously. Thanks to the hydrophobic surroundings, the fluid drops remain stable on the hydrophilic reaction fields during the incubation and do not run into one another. After a one-hour incubation period in the **hybridisation station**, the EUROArray slides are washed with special buffer solutions. The **washing procedure is fast and uncomplicated**: 10 slides are processed in just 5 minutes and can then be evaluated.

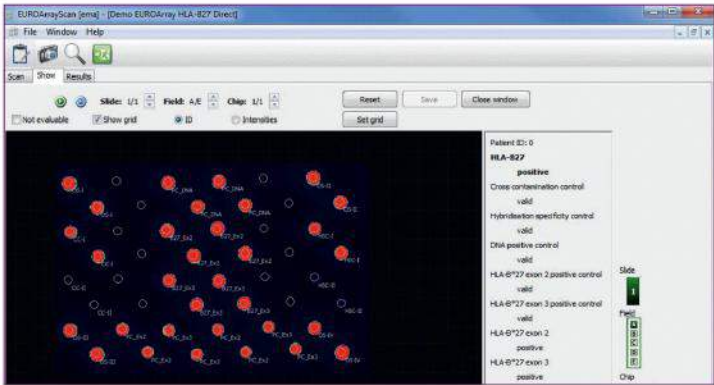




Fully automated standardised evaluation delivers fast and reliable results

With the EUROIMMUN Microarray Scanner and EUROArrayScan software, EUROArrays are evaluated easily, quickly and objectively without the need to study complicated manuals. EUROArrayScan software can be integrated into EUROLabOffice and other laboratory information management systems (LIMS) without any difficulties.

At the start of each run, the data for the samples to be examined are entered and are then transferred automatically into the working list by the software. After the incubated slides have been placed into the microarray scanner, the scanning procedure is initiated simply by a mouse click. EUROArrayScan software evaluates all data fully automatically, produces a report and documents and archives all results. Results for a EUROArray slide (up to five samples) are obtained in less than 20 seconds!



Evaluation using EUROArrayScan (e.g. HLA-B27 Direct)

Patient ID :	0	Test :	HLA-B27 direct
Result from :	17.03.2015	Protocol :	Demo EUROArray HLA-B27 Direct
Print date :	21.09.2015 10:31:34	Patient name :	0
		Page :	1
EUROIMMUN Medizinische Labordiagnostika AG Automatic evaluation with the EUROArrayScan software			
Partial result		Result	
Cross contamination control		valid	
Hybridisation specificity control		valid	
DNA positive control		valid	
HLA-B*27 exon 2 positive control		valid	
HLA-B*27 exon 3 positive control		valid	
HLA-B*27 exon 2		positive	
HLA-B*27 exon 3		positive	

Scanning a EUROArray slide (e.g. HLA-B27 Direct)

Reliability of analysis is ensured by many controls

Control	Used to check whether ...
Hybridisation specificity control	... the PCR products have bound specifically to the DNA probes
Cross contamination control	... there was any cross contamination from one test field to the other
DNA positive control	... the patient DNA was intact and present in sufficient quantity
PCR positive control	... PCR was successful (functioning of primers and PCR conditions)
Mutation control	... non-disease-associated neighbouring mutations are present that might interfere with the analysis
Negative control (automatically included)	... the analysis was performed correctly and there are no false positives

PRODUCT OVERVIEW

EUROArray test systems	Indication	Order no.	Features
NEW: APOE Direct	Alzheimer's disease	MN 5710-####-V	Detection of the APOE gene variants ε2, ε3 and ε4
HLA-B27 Direct	Ankylosing spondylitis	MN 5110-####-V	Improved specificity: differentiation of non-disease-associated HLA-B*27 alleles
HLA-B57:01 Direct	Abacavir hypersensitivity	MN 5210-####-V	Detection of all worldwide known HLA-B*57:01 alleles
HLA-Cw6	Psoriasis	MN 5410-####	Detection of all worldwide relevant HLA-C*06 alleles
HLA-DQ2/DQ8	Coeliac disease	MN 5310-####	Detection of all alleles relevant for HLA-DQ2/DQ8
Haemochromatosis (4 SNP+) Direct	Haemochromatosis	MN 5520-####-V	Detection of H63D, C282Y, S65C and E168X
Haemochromatosis (2 SNP+) Direct		MN 5521-####-V	Detection of H63D and C282Y
FV/FII+/MTHFR Direct	Thrombosis, thrombophilia	MN 5820-####-V	Detection of point mutations or single-nucleotide polymorphisms in the factor V gene (factor V Leiden, 1691G>A), in the factor II (prothrombin) gene (20210G>A) and/or in the MTHFR gene (677C>T and 1298A>C)
FV/FII+ Direct		MN 5821-####-V	
FV Leiden Direct		MN 5822-####-V	
FII+ Direct		MN 5823-####-V	
MTHFR Direct		MN 5824-####-V	
HPV	HPV detection/typing for cancer prevention	MN 2540-####	Detection and differentiation of 30 anogenitally occurring papilloma viruses for cancer prevention (cervical cancer); comprises all high- and low-risk HPV subtypes
NEW: STI (soon available)	Sexually transmitted infections	MN 2830-####	Detection of up to 11 relevant sexually transmissible pathogens (bacteria, viruses, protozoa)
Equipment		Order no.	Features
EUROArrayScan system		YG 0601-0101	EUROIMMUN Microarray Scanner including EUROArrayScan software
Hybridisation station (with one incubator insert)		YG 0615-0101	For EUROArray hybridisation
Hybridisation station (with two incubator inserts)		YG 0615-0101-1	
TITERPLANE reagent tray		ZM 9999-0105	Suited for parallel incubation of up to five EUROArray slides