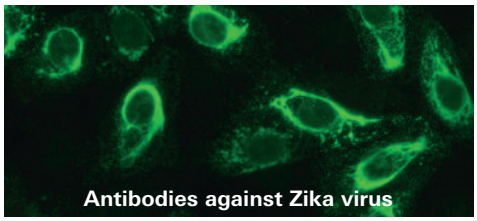
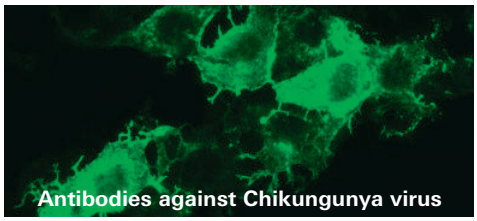
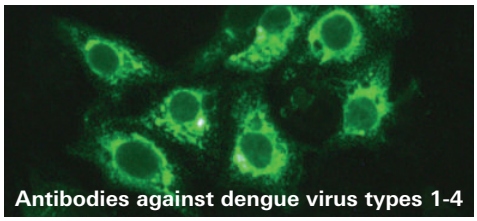
Arbovirus Fever Mosaic 2 (IgG or IgM)


Antibodies against Zika virus


Antibodies against Chikungunya virus


Antibodies against dengue virus types 1-4

- **Worldwide first commercial immunofluorescence test for the detection of antibodies against Zika virus**
- **BIOCHIP combination facilitates differential diagnostic delimitation of Zika, dengue and chikungunya virus infections**
- **Useful for identifying cross reactivities between Zika virus and dengue virus**

Technical data

Antigen substrate	Virus-infected cells (EU 14)
Sample dilution	Serum or plasma; Qualitative evaluation: 1:10 (IgG and IgM); semiquantitative evaluation: 1:10/100/1000 etc.
Test procedure	30 min (sample) / 30 min (conjugate), room temperature
Microscopy	Objective: 20x; excitation filter: 450-490 nm, colour separator: 510 nm, blocking filter: 515 nm light source: EUROIMMUN LED or mercury vapour lamp, 100 W, EUROStar Bluelight
Reagents	Ready for use, with the exception of the PBS Tween buffer (for dilution and washing)
Stability	All components are stable for at least 18 months from the date of manufacture
Test kit format	10 slides, each containing 5 or 10 test fields; kits include all necessary reagents (except for EUROSORB for the RF absorption: order no. ZF 1270-0145)
Order no.	**FI 2668-1005-1 G or M** (example for kits with 10 slides, each containing 5 test fields)

Clinical significance

Arboviruses are viruses that are predominantly transmitted by mosquitoes. The mosquito larvae multiply in open water reservoirs such as wells, cisterns and cloacae, as well as in small containers or waste in which rain water collects. Arboviruses transmitted to humans include members of the family of togaviruses and the family of flaviviruses. The species chikungunya virus, dengue virus types 1 to 4 and Zika virus cause febrile infectious diseases in Asia, Africa and South America. It is feared that they could spread to Central and North America and Europe. Aedes albopictus, the main viral vector, has already established itself in more than 12 southern and central European countries, including in the south of Germany. The main symptoms of the sometimes life-threatening diseases are high fever, accompanied by further characteristic symptoms such as exanthema and joint pain (accompanying arthritis), which can last for weeks or even months. Viral RNA or the virus itself can only be detected during a viraemic phase within the first 2 to 7 days after the onset of the disease using RT-PCR or performing an in vitro cultivation of the virus. Specific IgM antibodies can be detected from the 2nd to 4th day after onset of symptoms using indirect immunofluorescence and/or ELISA. The IgM titer is highest approximately two weeks after the onset of symptoms. IgM antibodies remain detectable for two to three months and sometimes for up to eight months as a persisting low specific IgM titer. A significant titer increase in specific IgG antibodies is also evidence of an acute infection.

Diagnostic application

The Arbovirus Fever Mosaic 2 is based on cells infected with different tropical and subtropical arboviruses. Laboratory diagnostic tests are important for differential diagnosis of Zika, chikungunya and dengue fever, since the symptoms of the diseases are very similar, making clinical discrimination virtually impossible. Since antibody cross reactions between dengue and Zika viruses can occur, the Arbovirus Fever Mosaic 2 was developed to enable secure interpretation of test results and differential diagnostic delimitation.

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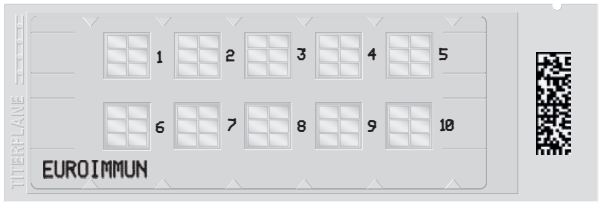
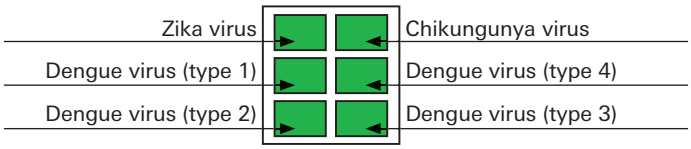
BIOCHIP arrangement

The Arbovirus Fever Mosaic 2 is available in two formats: slides with 5 or 10 analysis positions. Each field consists of 6 BIOCHIPs.





Specificity and sensitivity

Substrate	Ig class	n (total)	Reference (sample number, precharacterisation)	Specificity	Sensitivity
Zika virus	IgG	253	49 sera[1] from patients with Zika fever* 204 sera[2] from healthy blood donors	93.3%	95.6%
	IgM	199	49 sera[1] from patients with Zika fever* 150 sera[2] from healthy blood donors	98.7%	97.8%
Dengue virus (types 1-4)	IgG	310	31 patient samples[1,6,*] 79 sera[3] (precharacterised with another manufacturer's ELISA) 200 sera[2] from healthy blood donors	96.4%	96.6%
	IgM	249	21 patient samples[1,*] 78 sera[3] (precharacterised with another manufacturer's ELISA) 150 sera[2] from healthy blood donors	96.2%	98.5%
Chikungunya virus	IgG	269	100 sera[4] from patients with chikungunya fever (precharacterisation Anti-CHIKV ELISA**) 50 sera[1] from patients with chikungunya fever (Anti-CHIKV IIFT**) 19 sera[5] from patients with chikungunya fever (Anti-CHIKV ELISA**) 100 sera[2] from healthy blood donors	100%	96.7%
	IgM			95.0%	96.7%

[1]WHO Collaborating Centre for Arbovirus and Haemorrhagic Fever Reference and Research (WHOCC), Hamburg, Germany; [2]University Clinic Schleswig-Holstein, Campus Luebeck, Germany; [3]University of Jedda, Saudi Arabia; [4]National Reference Centre for Arboviruses, Institute Pasteur, Lyon, France; [5]National Reference Centre for Arboviruses, Marseille, France; [6]Robert-Koch Institute, Berlin, Germany; *Serologically precharacterised by in-house methods, **In-house assay

Reference range

Substrate	IgG	IgM
Zika virus	Titer < 1:100	Titer < 1:10
Dengue virus (types 1-4)	Titer < 1:100	Titer < 1:10
Chikungunya virus	Titer < 1:10	Titer < 1:10

The following antibody prevalences were obtained in apparently healthy blood donors from Germany:

Substrate	Antibody prevalence			
	IgG		IgM	
	n	Prevalence	n	Prevalence
Zika virus	208	5.3%	158	0.6%
Dengue virus (type 1)	200	0.5%	150	0%
Dengue virus (type 2)	200	0.5%	150	0.5%
Dengue virus (type 3)	200	0.5%	150	0.5%
Dengue virus (type 4)	200	0.5%	150	0%
Chikungunya virus	538	0.2%	149	1.3%

The following antibody prevalences were obtained in apparently healthy blood donors from Brazil:

Substrate	Antibody prevalence			
	IgG		IgM	
	n	Prevalence	n	Prevalence
Zika virus	49	73.5%	49	0%
Dengue virus (type 1)	49	69.4%	49	0%
Dengue virus (type 2)	49	75.5%	49	0%
Dengue virus (type 3)	49	73.5%	49	0%
Dengue virus (type 4)	49	71.4%	49	0%
Chikungunya virus	49	0%	49	0%

Note: Since the viral antigens of flaviviruses are closely related to each other, cross reactivity cannot be excluded. Particularly IgG antibodies against viruses of the flavivirus genus show significant cross reactivity in internal studies. EUROIMMUN recommends determination of the end-point titer using serial dilutions of the patient sample. This is particularly useful in primary flavivirus infections. In a secondary infection (e.g. previous vaccination or flavivirus infection) a high IgG antibody cross reactivity must be assumed. A follow-up confirmatory test with a higher specificity should ideally be performed. IgM antibodies are generally less cross-reactive.

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