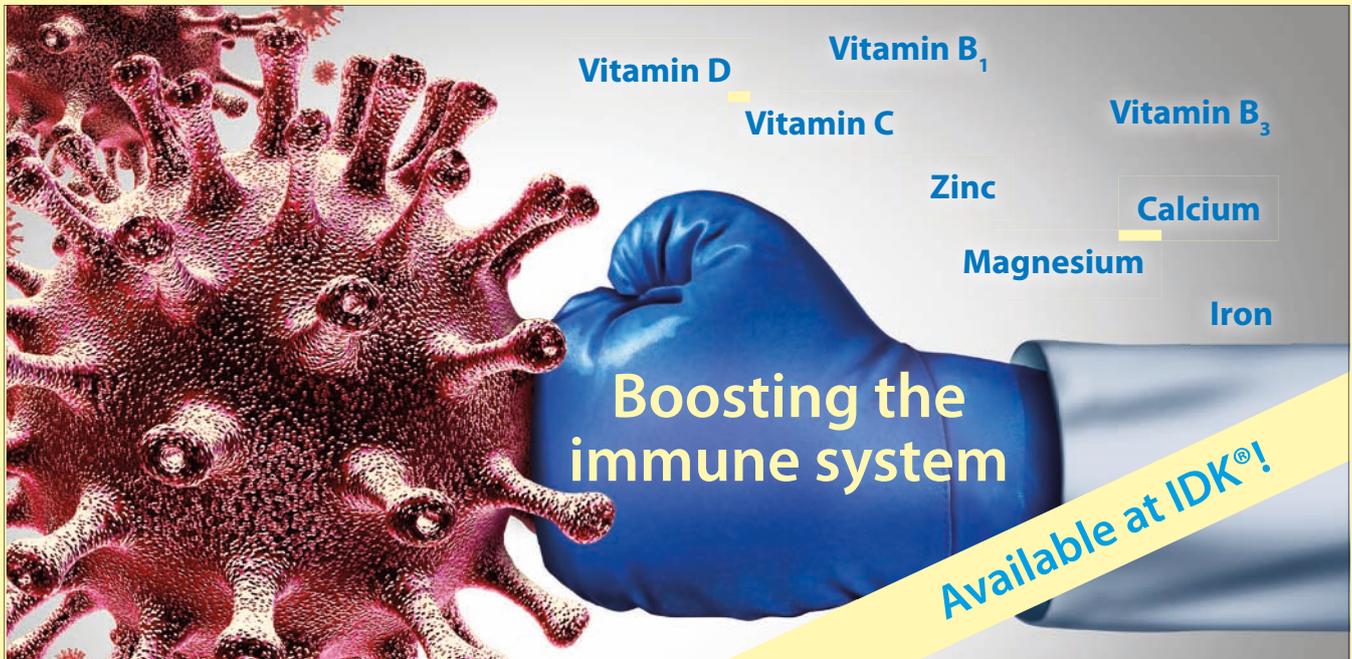


COVID-19 Prevention



SARS-CoV-2 infection control

- ⇒ PCR: Detection of an acute infection
- ⇒ ELISAs: Detection of an induced immune response

Specific strengthening of the immune system

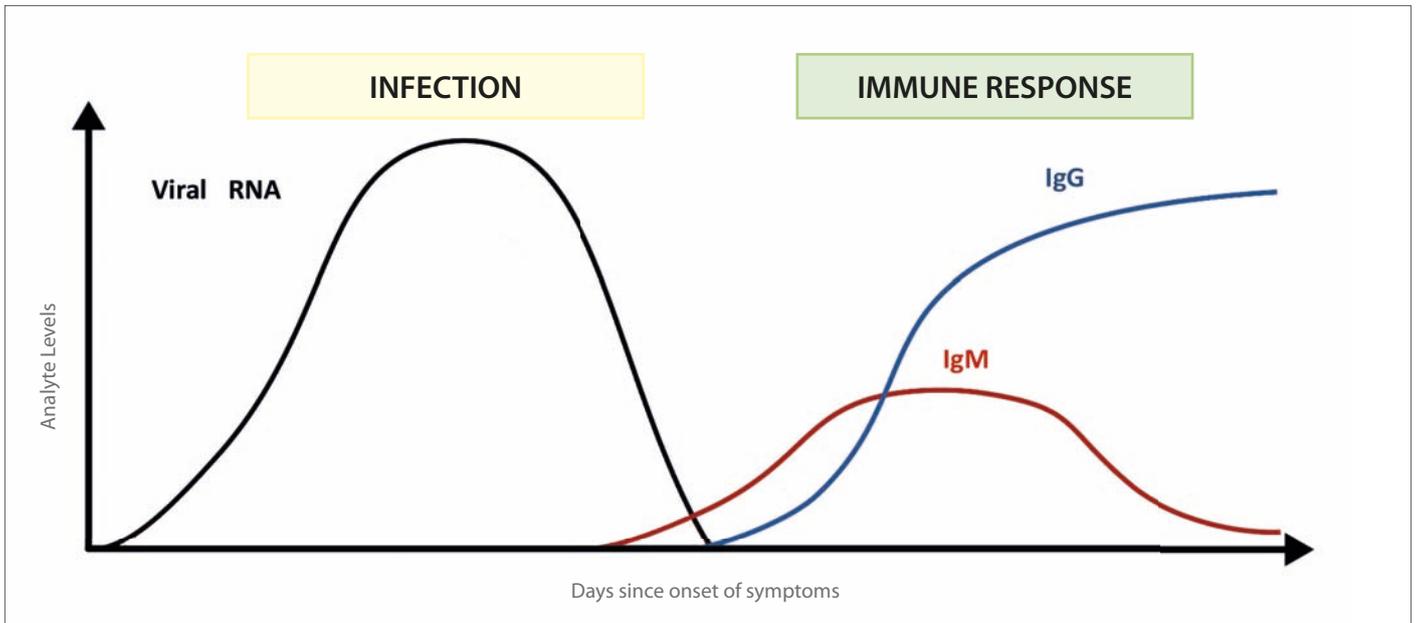
- ⇒ Checking the **vitamin status**
- ⇒ Important **trace elements**



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SARS-CoV-2 infection control



➤ PCR: MutaPLEX® Coronavirus

Detection of an acute infection
qualitative Real time RT-PCR

- ▶ Multiple target sequences with SARS-CoV-2, beta-coronaviruses and eukaryotic b-ac
- ▶ Extraction control / internal process controle
- ▶ Internal system control (ISC) ensures via the human housekeeping gene β -actin correct & sufficient sample collection with the nasal (resp. nasopharyngeal or throat) smear by use of flocked synthetic swabs, as recommended by the RKI)

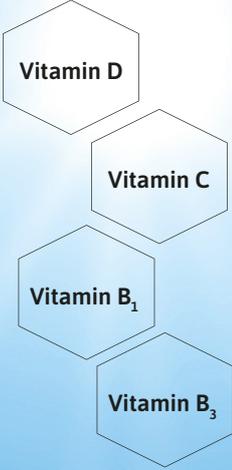
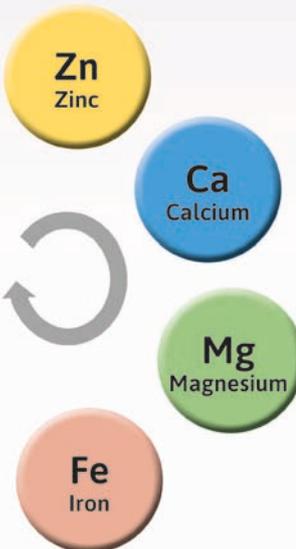
➤ ELISA IgM and ELISA IgG: SARS-CoV-2

Detection of an induced immune response
serological detection of antibodies

- ▶ IgM: Determination of early immune response
- ▶ IgG: Determination of long-term immune response
- ▶ Perfect addition to virus detection by RT-PCR in suspected cases without clinical symptoms
- ▶ Investigation of epidemiology and geographical spread of SARS-CoV-2
- ▶ Provides information on the immune status of medical staff



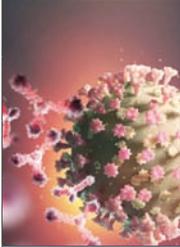
COVID-19 prevention by specific strengthening of the immune system

		Recommendation	Risk group	COVID-19 patients
VITAMINS 	Vitamin D Sufficient vitamin D levels in serum reduce the risk of severe courses of COVID-19	Determination of the status of 25-OH vitamin D & vitamin D binding protein	✓	✓
	Vitamin C Antiviral, anti-inflammatory and immunostimulating effect reduces susceptibility to infection with SARS-CoV-2	Determination of the vitamin C status	✓	✓
	Vitamin B₁ Thiamine may be useful in combination with vitamin C for the treatment of sepsis (e.g. COVID-19)	Monitoring of the vitamin B₁ & vitamin C levels	✓	✓
	Vitamin B₃ & Tryptophan Strengthening of the immune system and possible reduction of the risk of severe courses of COVID-19 by vitamin B ₃ , which is produced in the body depending on tryptophan	Determination of the vitamin B₃ & tryptophan levels in serum	✓	✓
TRACE ELEMENTS 	Zinc & Thymulin Zinc deficiency causes at the same time a decrease in the thymulin level and reduces the defence of the immune system and increases susceptibility to infections	Determination of the zinc & thymulin levels in blood	✓	✓
	Calcium & Magnesium Calcium concentration in serum is regulated by vitamin D Vitamin D metabolising enzymes need magnesium as a co-factor	Determination of the vitamin D, calcium & magnesium levels	✓	✓
	Iron & Ferritin Iron storage protein increases COVID-19 induced proinflammatory cytokines and is a marker for the severity of the disease	Determination of iron & ferritin in serum	✓	✓

Further monitoring parameters for COVID-19

- **Prealbumin:** Prealbumin (transthyretin) is a sensitive marker for hepatic damage. Decreased values can be used for early diagnosis of COVID-19 (prealbumin seems to be even more sensitive than CRP).
Recommended laboratory diagnostics: Determination of prealbumin in serum of COVID-19 patients
- **CRP:** C-reactive protein increases in the case of a SARS-CoV-2 infection based on the inflammatory reactions induced by the virus.
Recommended laboratory diagnostics: Determination of CRP in COVID-19 patients
- **Albumin:** Kidney damage can be caused in severe courses of disease.
Recommended laboratory diagnostics: Determination of albumin in the urine of COVID-19 patients

Available at Immundiagnostik:

		Product	Method	Cat. No.
	SARS-CoV-2	MutaPLEX® Coronavirus	qualitative Real-Time-RT-PCR	KG192696
		IDK® anti-SARS-CoV-2 IgG (Detection of Spike protein S1)	ELISA	K 5000
		EDI™ Novel Coronavirus IgM (Detection of nucleocapsid protein)	ELISA	KKT1033
		EDI™ Novel Coronavirus IgG (Detection of nucleocapsid protein)	ELISA	KKT1032
	Vitamins	25-OH-Vitamin D	CLIA	K 2010
			ELISA	K 2020
			ELISA (dried blood)	K 2020DBS
		25-OH-Vitamin D₃ / D₂	HPLC Reversed Phase	KC3000
			LC-MS/MS	KM5000
		Vitamin D binding protein VDBP	ELISA	K 2314
		Vitamin C	HPLC	KC2900
			colorimetric	K 4000
Vitamin B₁ (Thiamine)	direct MTP assay	KIF001		
	HPLC	KC2201		
Vitamin B₃ (Niacin)	direct MTP assay	KIF003		
	Trace elements	Zinc (RUO)	colorimetric	KJCZN001
		Calcium (RUO)	colorimetric	KJCCA030
		Magnesium (RUO)	colorimetric	KJCMG035
		Iron (RUO)	colorimetric	KJCFE005
		Ferritin	ELISA	KD1872
	others	Thymulin (RUO)	ELISA	KR9810
		IDK® prealbumin	ELISA	K 6331
		CRP	ELISA	K 9710s
		Albumin	ELISA	K 6330
		IDK® Tryptophan	ELISA	K 7730