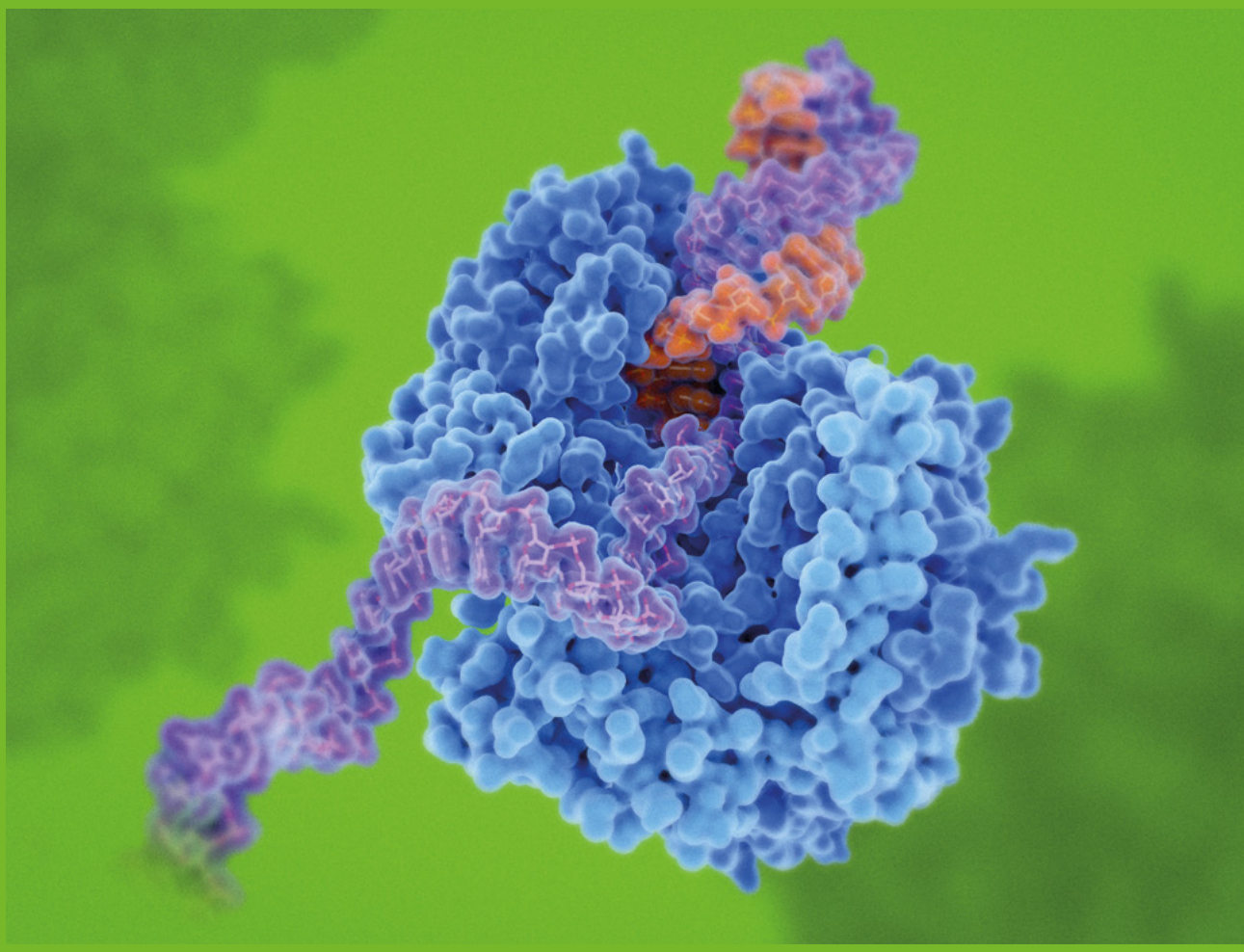
Jena Bioscience

REAL-TIME PCR



Dye-based Detection – Probe-based Detection & Multiplex
Direct Amplification – Lyophilisation – Supplements
Dual Labeled Probes

Molecular Biology

Unleash the Power of Real-Time PCR with ready-to-use reagents, customized solutions and comprehensive scientific support!

Master mixes – Freeze-dried reagents – OEM & Bulk supplier

WE DEVELOP LIFE SCIENCE REAGENTS

Jena Bioscience, with over 25 years of experience in academic know-how, is a leading provider of innovative and high-quality reagents and customized services in the life science field.

We have successfully served clients in over 100 countries, offering tailored solutions for DNA and RNA amplification.

Our extensive portfolio includes single reagents, complex kits, and optimized master mixes for purification, amplification, and modification of DNA.

We provide reliable and efficient solutions for all your PCR-related techniques.

Certification – Ensuring Quality and Excellence

Our state-of-the-art production facility and the comprehensive quality management system in accordance with DIN EN ISO 9001 and DIN EN ISO 14001 ensures highest quality standards for all our products.

IFTA AG
Certified QMS and EMS according to
DIN EN ISO 9001 and DIN EN ISO 14001
Reg.-No.: ICV03597 034 and ICV03597 534

REAL-TIME PCR PRODUCTS

Unmatched price structure to performance ratio in the market

Real-Time PCR Master Mixes

Ready-to-use solutions

- Dye-based Detection
- Probe-based Detection & Multiplex
- Direct Amplification

Page 6

Lyophilisates

Room temperature storage

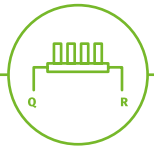
- Dye-based Detection
- Probe-based Detection

Page 14

Supplements

Enhancer for PCR

Page 16



Dual-labeled Probes

Probes and quencher

Page 17

Lab to Bulk

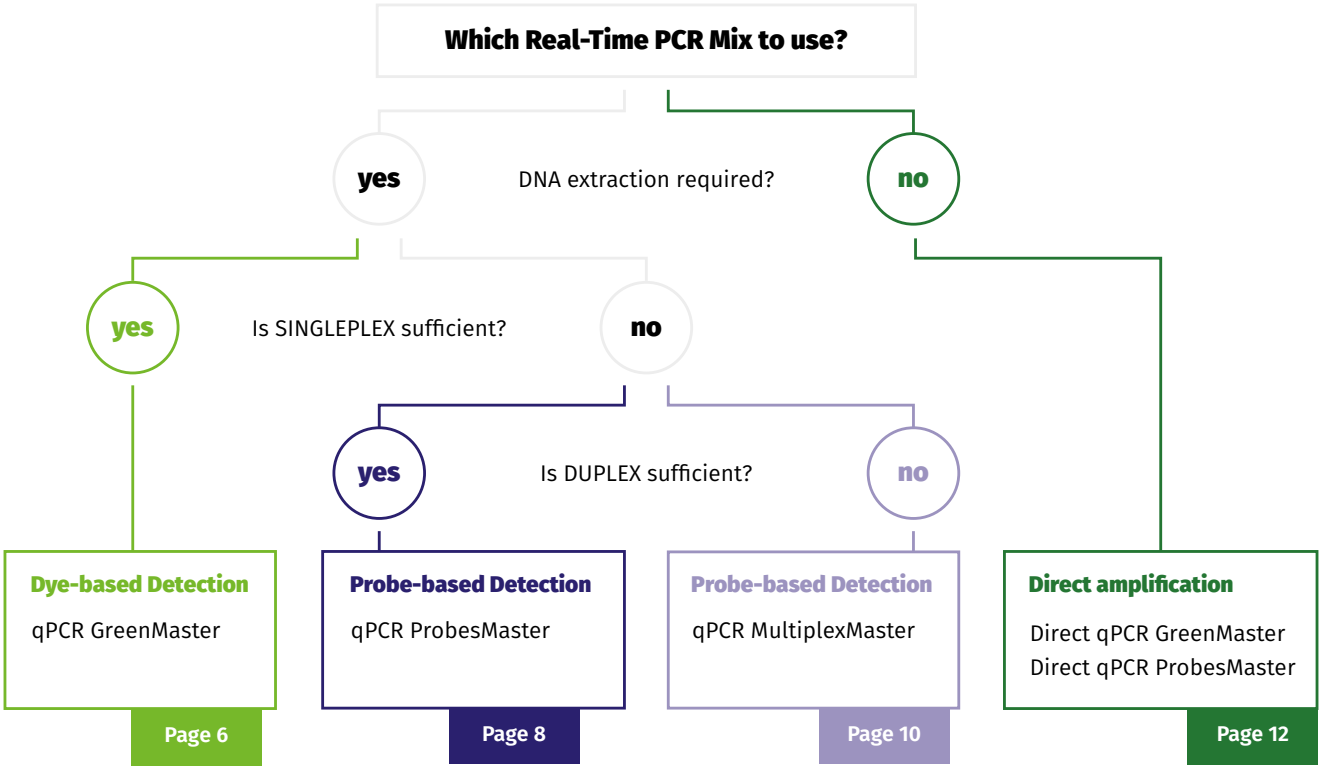
Move from lab to bulk scale for more flexibility with variable quantity options.

Liquid & Lyophilized

Convenience and ease for use of liquid products and long time storage at room temperature with lyophilized options.

Ready-to-use & customized

Tailored RT-qPCR products, custom-made to match your exact research requirements.



	Real-Time PCR			
		Separate DNA extraction		Direct amplification
Green-fluorescent Dye	•			•
Dual-labeled Probes		•	•	•
Specificity	•	• •	• •	• •
Sensitivity	•[1]	• •	• •	• •
Multiplexing		•	• •	• •
Costs	•	• •	• • •	• •
Turnaround time	•	•	•	• •
High throughput	•	•	• •	• • •
		Applications		
Genexpression	•	•	•	•
Genotyping	•	•	•	•
Mutation detection		•	•	•
Pathogen identification		•	•	•
Species diversity analysis	•	• •	• •	• •

[1] variable

DYE-BASED REAL-TIME PCR

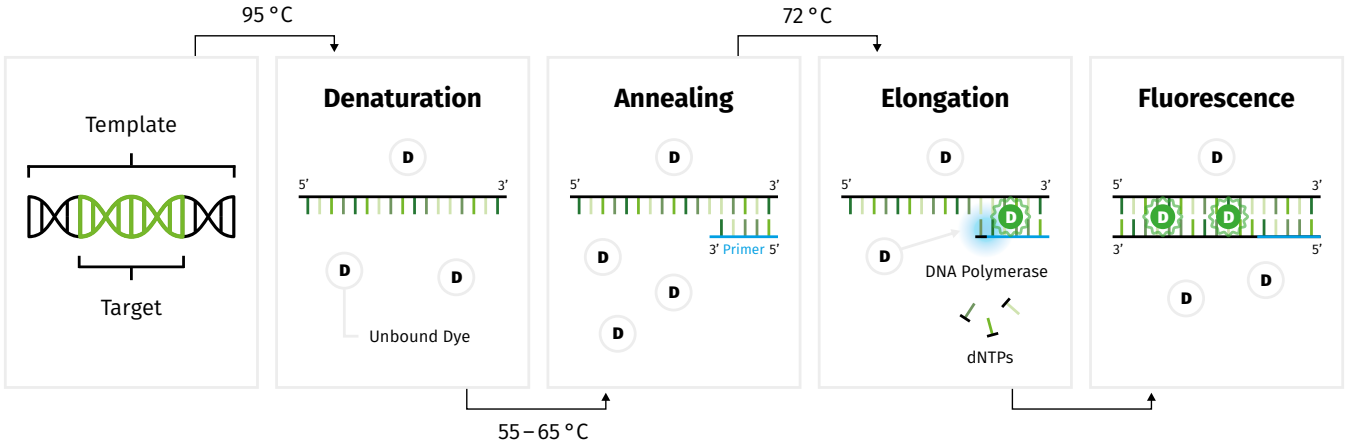
with high throughput potential

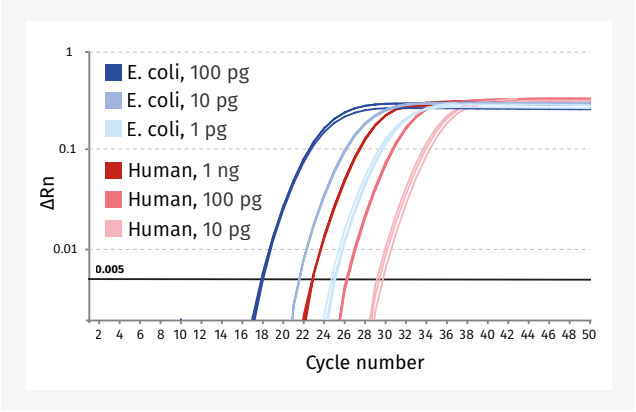
The **green-fluorescent dye** intercalates into double-stranded DNA molecules during PCR reaction.

PCR mixture with template DNA, primers and green-fluorescence dye is heated to denature the DNA strands.

DNA polymerase prolongs the DNA. The green dye intercalates specifically into double stranded DNA and the fluorescence intensity increases in direct correlation with the amount of DNA present.

Method of Dye-based Real-Time PCR





Functional QC: Amplification of human DNA and E. coli DNA templates

Reproducible and low variability levels with various starting DNA amounts. Amplification plot of ß-actin gene from human DNA and of 16S rRNA gene for detection of bacterial DNA (E.coli). qPCR GreenMaster #PCR-374 was used for real-time PCR. Starting DNA amount was 1 pg, 10 pg and 100 pg of E. coli and 10 pg, 100 pg and 1 ng of human DNA.

Cat.-No.	Amount	Conc.	Reactions
qPCR GreenMaster			
PCR-372S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-372L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl
qPCR GreenMaster lowROX			
PCR-373S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-373L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl
qPCR GreenMaster highROX			
PCR-374S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-374L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl
qPCR GreenMaster UNG			
PCR-375S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-375L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl

Did you know? – UNG

Uracil-N-Glycosylase specifically cuts uracil from DNA by cleaving the glycosidic bond. It is used to decontaminate PCR assays from previous amplified DNA. The PCR reaction is performed with dUTP instead of dTTP. Before the next run is started, UNG incubation (followed by heat inactivation) prevents potential carry-over contamination.

PROBE-BASED REAL-TIME PCR

Probe-based with high sensitivity and specificity

Specially designed **dual-labeled probes** bind to the target sequence and emit a signal when amplified.

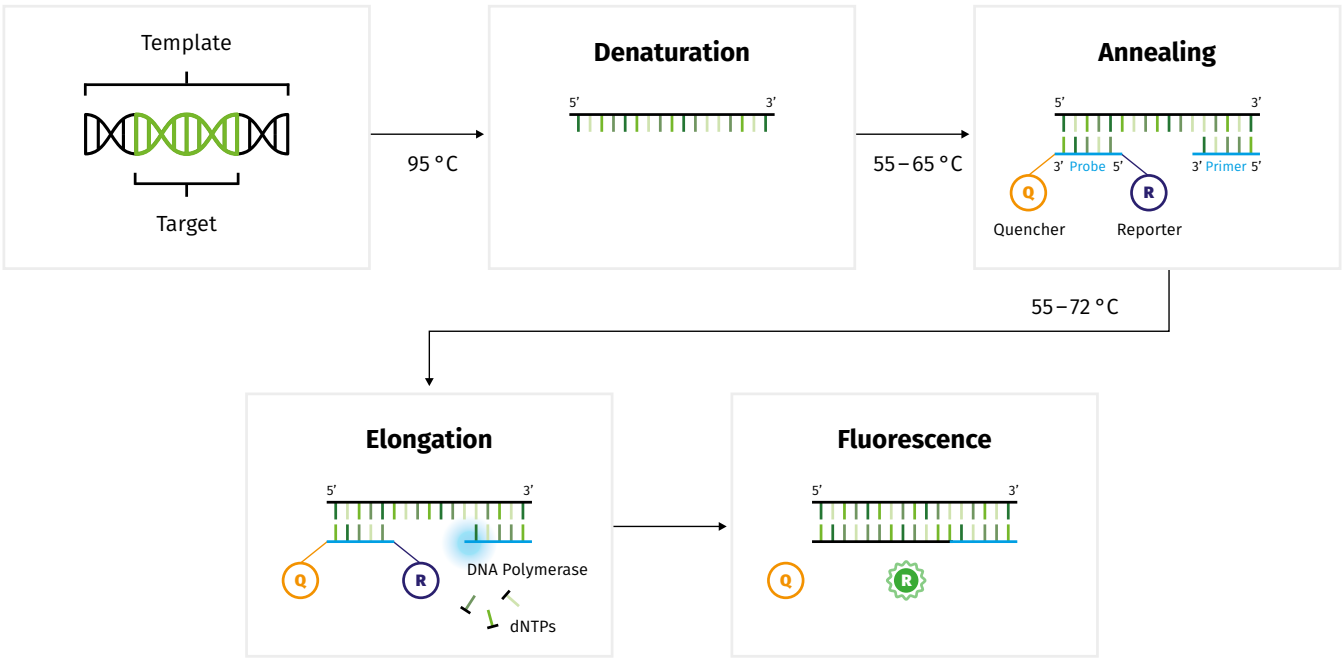
PCR mixture with template DNA, primers and probes labeled with a reporter dye (R) and a quencher (Q) is heated to denature the DNA strands.

DNA polymerase prolongs the DNA strand and the exonuclease activity degrades the probe. As the reporter dye is no longer in close proximity to the quencher, the resulting increase in reporter emission intensity is easily detected.

qPCR ProbesMaster Kits

- Contain all reagents (just add template, primer and probes)
- Hot-start polymerase
- With or without UNG (Uracil-N-Glycosylase)
- No ROX, low ROX or high ROX as reference dye for cycler-internal signal normalization

Method of Probe-based Real-Time PCR



Cat.-No.	Amount	Conc.	Reactions
qPCR ProbesMaster			
PCR-360S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-360L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl
qPCR ProbesMaster lowROX			
PCR-361S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-361L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl
qPCR ProbesMaster highROX			
PCR-362S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-362L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl
qPCR ProbesMaster UNG			
PCR-363S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-363L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl
qPCR ProbesMaster UNG lowROX			
PCR-364S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-364L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl
qPCR ProbesMaster UNG highROX			
PCR-365S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-365L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl

Did you know? – ROX

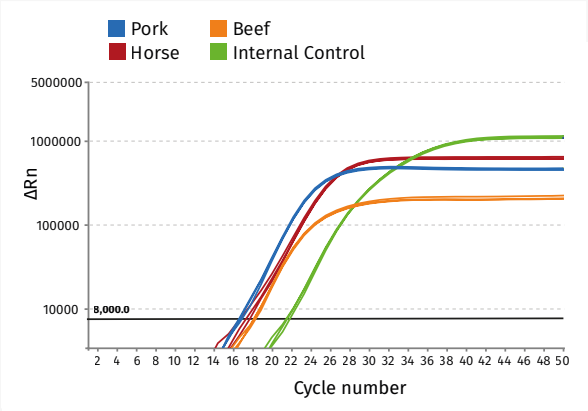
The reference dye normalizes fluctuations of fluorescence signal caused by the PCR cycler or pipetting differences. ROX does not affect the PCR reaction but maintains a stable fluorescence baseline. The use of ROX (no/low/high) depends on the cycler type, which should be checked in the operating manual.

PROBE-BASED MULTIPLEX PCR

Amplification of multiple targets in a single tube

- → Simultaneous real-time analysis of > 2 target sequences
- → Robustness against a multitude of PCR inhibitors
- → Excellent sensitivity for amplification of lowest template amounts

PCR with all four primer pairs from a single tube



Meat Detection and Food Control

4-plex reaction using the qPCR MultiplexMaster #PCR-340. Amplification plot for 4-plex reaction with 1ng DNA of various meat samples (pork, horse, beef) as well as an internal positive control.

Cat.-No.	Amount	Conc.	Reactions
qPCR MultiplexMaster			
PCR-340S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-340L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl

Did you know? – Multiplex Direct Amplification

Our MultiplexMaster Kit can also be used for direct amplification without prior DNA purification by adding our Extraction Buffer #PCR-534 to the sample. More info: pp 12 and 16

DIRECT AMPLIFICATION

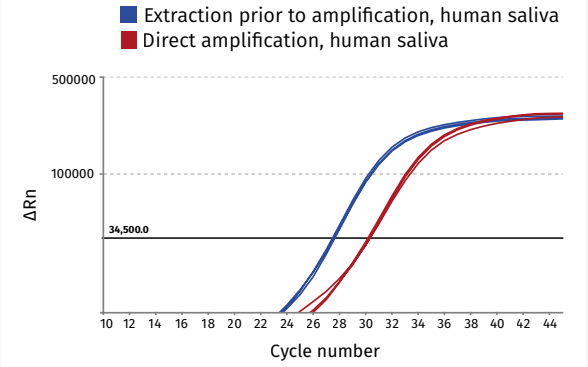
No need for time-consuming DNA extraction – perfect for Point-of-Care applications

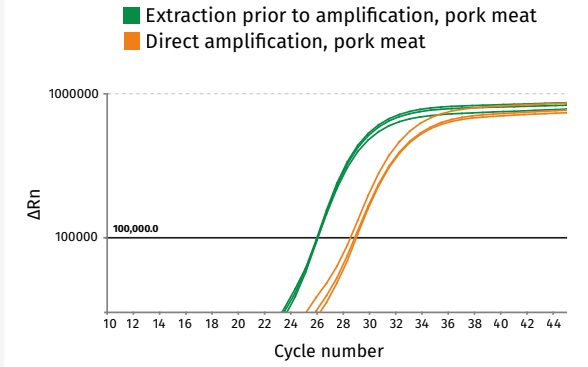
Pro

- Automatable for high throughput
- Reduce DNA preparation time by 70 – 90 %
- No inhibition for a multitude of sample matrixes
- Time & cost efficient
- Minimize sample loss
- Less plastic consumables

Contra

- Complex matrixes can interfere with PCR
- Lower sensitivity



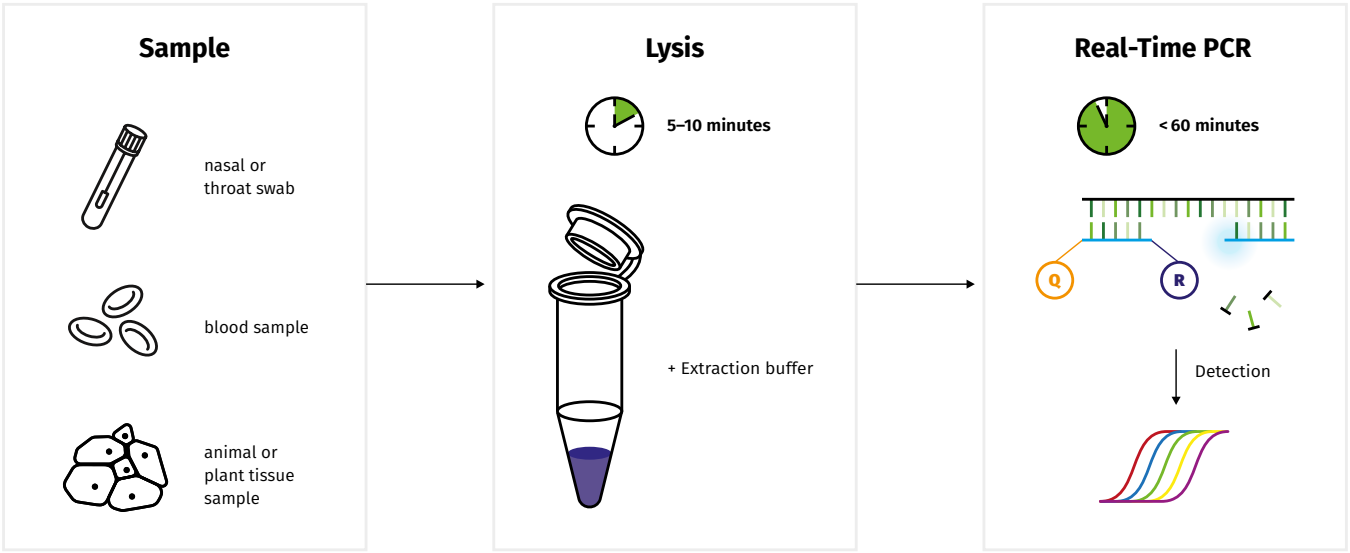


Comparison of classical DNA purification prior to amplification and direct amplification with different sample matrices (left figure: human saliva sample right figure: pork meat sample)

Amplification of ß-actin gene. Sample DNA was prepared with **Tissue DNA Preparation – Column Kit #PP-236**.

Direct amplification was performed without purification. **Direct qPCR ProbesMaster #PCR-396** (human saliva) and **MeatDetect qPCR Pork (Halal) #PCR-701** (pork) were used for real-time PCR.

Method of Direct Amplification



Cat.-No.	Amount	Conc.	Reactions
Direct qPCR GreenMaster			
PCR-344S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-344L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl
Direct qPCR GreenMaster highROX			
PCR-345S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-345L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl
Direct qPCR ProbesMaster			
PCR-396S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-396L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl
Direct qPCR ProbesMaster highROX			
PCR-397S	2 × 1.25 ml	2 ×	250 reactions × 20 µl
PCR-397L	10 × 1.25 ml	2 ×	1,250 reactions × 20 µl

LYOPHILISATES

Long term storage without cooling

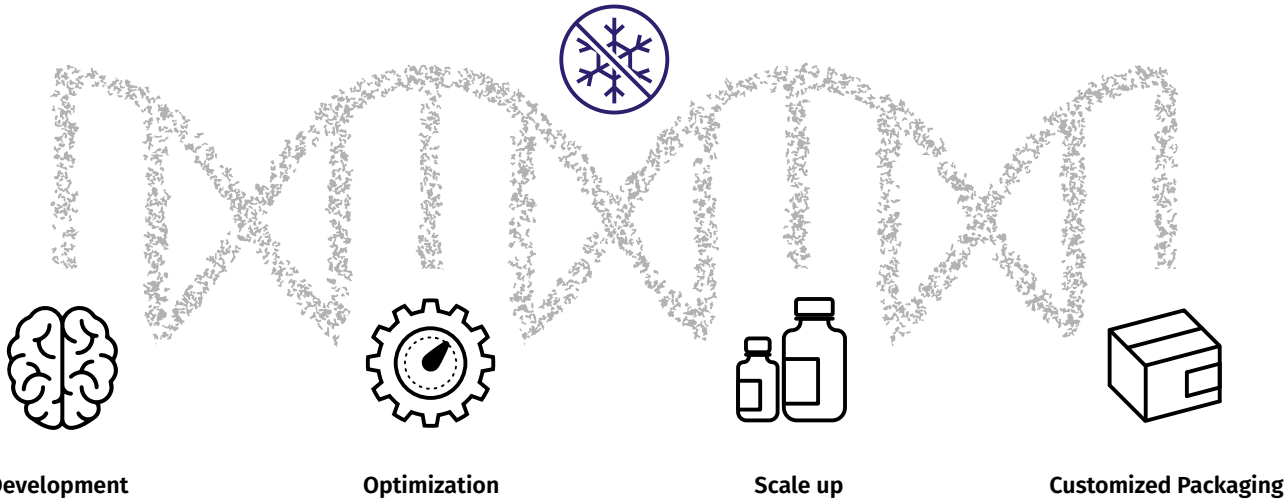
- → Ready-to-use reagents: Pre-aliquoted with all required reagents
- → No fridge required
- → Stable at ambient temperature
- → Reduced contamination risk

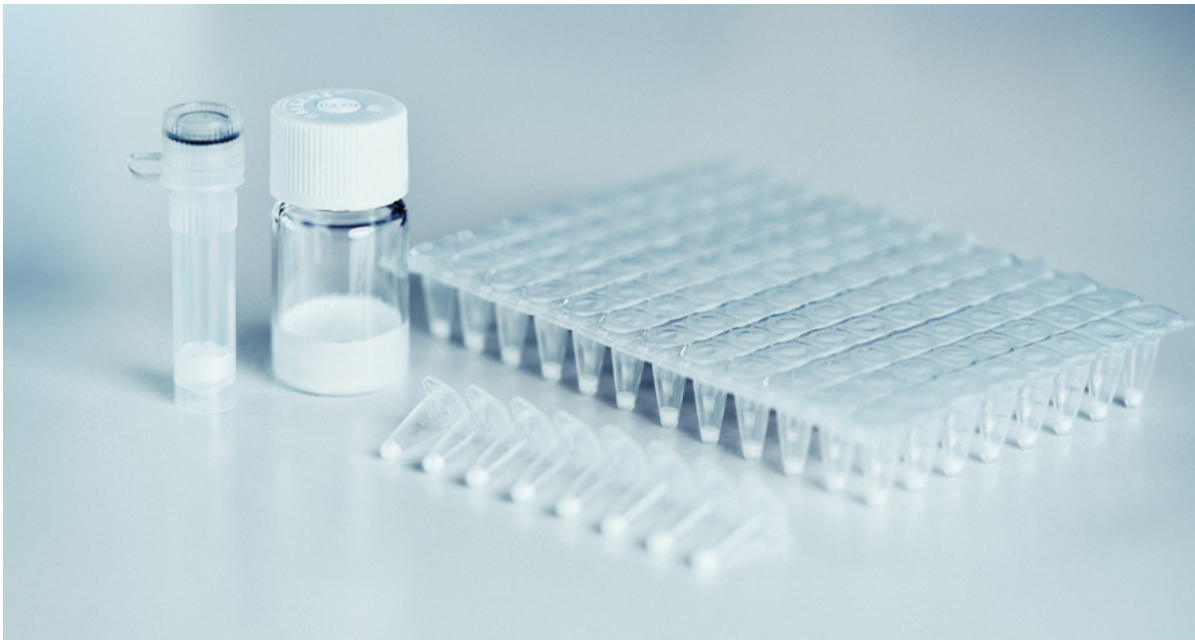
Lyophilisation Brochure

Have a look at our lyophilisation brochure.
Feel free to request your copy:
molbio@jenabioscience.com

Lyophilisation Service

Tailored lyophilisates according to your requirements.
Contact us for customized lyophilisation services: **molbio@jenabioscience.com**





Lyophilized Mixes

Ready-to-use lyophilisates with a complete master mix[1] in a dry, room temperature stable format

Cat.-No.	Reactions
qPCR GreenMaster Lyophilisate	
PCR-173S	192 reactions × 20 µl
PCR-173L	960 reactions × 20 µl
qPCR ProbesMaster Lyophilisate	
PCR-156S	192 reactions × 20 µl
PCR-156L	960 reactions × 20 µl

[1]Just add template DNA in water and start the cycler.

Liquid Mixes for Lyophilisation

Liquid master mixes optimized for freeze-drying in your own production facilities

Cat.-No.	Amount	Conc.	Reactions
Liquid qPCR GreenMaster Lyophilisate			
PCR-189-1ML	1 ml	2.5 ×	125 reactions × 20 µl
PCR-189-10ML	10 ml	2.5 ×	1,250 reactions × 20 µl
Liquid qPCR ProbesMaster Lyophilisate			
PCR-188-1ML	1 ml	2.5 ×	125 reactions × 20 µl
PCR-188-10ML	10 ml	2.5 ×	1,250 reactions × 20 µl

SUPPLEMENTS

Helpful tools for real-time PCR functional testing or quality control of qPCR polymerases and qPCR assay conditions.

- → **Thermolabile UNG**
- → **DNA Stain**
- → **Reference Dye**
- → **Direct Extraction Buffer**

Cat.-No.	Amount	Conc.
Thermolabile UNG (Uracil N-Glycosylase)		
PCR-353	200 units	1 unit/µl
Green-Fluorescent DNA Stain		
PCR-378	500 µl	100 µM
ROX Reference Dye		
PCR-351	1 ml	25 µM
PCR-356-1ML	1 ml	100 µM
Direct Extraction Buffer		
PCR-534-15ML	15 ml	10 ×
PCR-534-100ML	100 ml	10 ×

DUAL LABELED PROBES

DNA oligonucleotides carrying a fluorophore (5'-end) and a quencher (3'-end). The labeled probe hybridizes sequence-specifically to its complementary sequence on the amplicon.

- Increase efficiency and specificity
- Enable multiplex analyses
- Maximal assay design flexibility

Probes and quencher are available in the following concentrations:

- 5 to 9 nmol
- 10 to 19 nmol
- 20 to 29 nmol
- 30 to 49 nmol
- 50 to 70 nmol

- **Purification:** HPLC
- **Quality check:** MALDI TOF
- **Sequence lengths:** up to 40 bp
- **Customized combinations** available

Selecting the correct reporter dye and quencher

Criterion	Reporter Dye Selection	Quencher Selection
Instrument compatibility	Ensure compatibility with your real-time PCR instrument's detection channels	
Background signal	Ensure low background signal for accurate measurements	
Spectral characteristics	Choose reporter dyes with minimal spectral overlap for multiplexing	Dark quencher are often preferred for multiplexing
Fluorescence emission maximum (λ_{max})	Match reporter dye's λ_{max} with your instrument's filter settings	

SELECTING REPORTER DYE AND QUENCHER

Select from Jena Bioscience's extensive reporter/quencher repertoire or inquire for alternative combinations:
molbio@jenabioscience.com

5' Reporter			3'-Quencher						
			BHQ-1®	BHQ-2®	BHQ-3®	BHQ-650	ECLIPSE	DABYL	TAMRA*
	Excitation max [nm]	Emission max [nm]	Quenching rate [nm]	480-580	550-650	620-730	550-750	390-625	380-550	470-560
			Quenching max. [nm]	535	579	672	650	522	453	544
ATTO-390	390	476						•	•	•
ATTO-425	439	485		•				•	•	•
LC*Cyan500	450	500		•				•	•	
6-FAM	495	520		•	•			•	•	•
Fluo	495	520		•	•			•	•	•
FITC	490	525		•	•			•	•	•
ATTO-495	498	526		•				•	•	•
TET	521	536		•	•			•	•	•
ATTO-520	517	538		•				•	•	•
JOE	522	548		•				•	•	•
Yakima Yellow	530	549		•				•	•	•
HEX	535	556		•	•		•	•	•	•
ATTO-Rho6G	533	557		•	•		•	•	•	
Cy3	546	563			•		•	•		
TAMRA'	564	579			•		•	•	•	
ROX	576	601			•		•	•		•
Texas Red	586	610			•		•	•		
LC*Red610	590	610			•		•	•		
ATTO-Rho13	603	627			•	•	•			
DY480ßXL	500	630			•		•			
LC'Red640	625	640			•	•	•			
ATTO-Rho14	625	646			•	•	•			
CY5	646	662			•	•	•			
CY5.5	683	705			•	•	•			•
IRD700	685	705			•	•	•			•

Did you know? – Black Hole quencher and TAMRA

Black Hole dark quencher (BHQ) probes are designed to absorb the probe fluorescence almost completely, thus ensuring a very high signal-to-noise ratio. Nevertheless, TAMRA is still used as quencher, especially in combination with the reporter dye FAM. Please note that TAMRA is not a dark quencher and contributes to an increase in the background signal due to its own fluorescence emission.

Contact our Real-Time PCR experts

Send us an e-mail: **molbio@jenabioscience.com**

Dr. Bürk Schäfer
Head of Molecular Biology Department

Dr. Juliane Buschmann
Business Development Manager

Jena Bioscience

Jena Bioscience GmbH
Loebstedter Str. 71
07749 Jena
Germany

Phone: +49(0)3641-6285 000
Mail: info@jenabioscience.com