

Fluorophore and BHQ selection chart

This chart is intended to guide you through the dye selection process for your oligonucleotide. Fluorophore and quencher combinations may be designed to support applications such as probe-based qPCR, SNP genotyping, CNV, presence/absence and more.

Fluorophore		Alternate dyes		DYE-5' - T ₁₀		Recommended quencher	BHQ™ dye quenching range
				Excitation	Emission		
●	Biosearch Blue™			356	454	BHQ-1	BHQ-0 430-520 nm
	FAM			495	520	BHQ-1	
	TET			521	536	BHQ-1	
●	CAL Fluor™ Gold 540	VIC®/TET/JOE		522	544	BHQ-1	BHQ-1 480-580 nm
●	CIV-550™	VIC		530	550	BHQ-1	
	VIC	CIV-550/CAL Fluor Orange 560		530	550		
	JOE			529	555	BHQ-1	
	HEX			535	556	BHQ-1	
●	CAL Fluor Orange 560	VIC/HEX/JOE/CIV-550		538	559	BHQ-1	
●	Quasar™ 570	Cy 3		548	566	BHQ-2	
	Cy™3			549	566		
	TAMRA			557	583	BHQ-2	
●	CAL Fluor Red 590	TAMRA		569	591	BHQ-2	
	ROX™			586	610	BHQ-2	BHQ-2*
●	CAL Fluor Red 610	Texas Red/ROX/Alexa Fluor® 594		590	610	BHQ-2	
	Cy 3.5			594	612		
	Texas Red®			597	616		
	LC Red® 640			619	637		
●	CAL Fluor Red 635	LC® Red 640		618	637	BHQ-2	
	Cy 5			646	669		
●	Quasar 670	Cy 5		647	670	BHQ-2*, BHQ-3	
●	Quasar 705	Cy 5.5		690	705	BHQ-2*, BHQ-3	
	Cy 5.5			694	711		BHQ-3 620-730 nm

* BHQ-2 dye is recommended for **Quasar 670** and **Quasar 705** fluorophores due to static quenching.

● Indicates Biosearch Technologies' proprietary dyes

Dyes in **BOLDFACE** are available modifications for labeled oligos.

Many dyes are also available in the form of nucleic acid chemistry reagents. Please visit www.biosearchtech.com for current product offerings.

Multiplexing recommendations for BHQ Probes and primers



These dye recommendations apply to Black Hole Quencher™ (BHQ) Probes of LGC, Biosearch Technologies™ and may not apply to other probe formats. For tips and guidelines related to qPCR and SNP genotyping, please visit: www.biosearchtech.com.

Instrument*	Company	Calibration required?	Dye 1	Dye 2	Dye 3	Dye 4	Dye 5	Dye 6
IntelliQube™	Biosearch Technologies	Yes	FAM	CIV-550	TAMRA	ROX™	Quasar 670	
Nexar™	Biosearch Technologies	No	FAM	HEX	CAL Fluor Red 610			
SNPline™	Biosearch Technologies	No	FAM	CIV-550	TAMRA	Quasar 670		
MX3000P™	Agilent®	No	FAM	CIV-550	CAL Fluor Red 610	Quasar 670		
Mx3005P™	Agilent	Yes	FAM	CIV-550	TAMRA	CAL Fluor Red 610	Quasar 670	
MX4000®	Agilent	No	FAM	CIV-550	CAL Fluor Red 610	Quasar 670		
qTOWER3 Series	Analytik Jena	Yes	FAM	CIV-550	TAMRA	CAL Fluor Red 610	Quasar 670	Quasar 705
PRISM® 7000	Applied Biosystems®	Yes	FAM	CIV-550	TAMRA	ROX		
7300	Applied Biosystems	Yes	FAM	CIV-550	TAMRA	ROX		
7500/7500 Fast	Applied Biosystems	Yes	FAM	CIV-550	TAMRA	ROX	Quasar 670	
PRISM 7700	Applied Biosystems	Yes	FAM	CIV-550	TAMRA	ROX		
7900HT/7900HT Fast	Applied Biosystems	Yes	FAM	CIV-550	TAMRA	ROX		
QuantStudio™ 3 System	Applied Biosystems	Yes	FAM	CIV-550	TAMRA	CAL Fluor Red 610		
QuantStudio 3D Digital	Applied Biosystems	Yes	FAM	CIV-550	CAL Fluor Red 610			
QuantStudio 5 System	Applied Biosystems	Yes	FAM	CIV-550	TAMRA	CAL Fluor Red 610	Quasar 670	
QuantStudio 6 Flex	Applied Biosystems	Yes	FAM	CIV-550	TAMRA	CAL Fluor Red 610	Quasar 670	
QuantStudio 6 Pro	Applied Biosystems	Yes	FAM	CIV-550	TAMRA	CAL Fluor Red 610	Quasar 670	
QuantStudio 7 Flex	Applied Biosystems	Yes	FAM	CIV-550	TAMRA	CAL Fluor Red 610	Quasar 670	
QuantStudio 7 Pro	Applied Biosystems	Yes	FAM	CIV-550	TAMRA	CAL Fluor Red 610	Quasar 670	
QuantStudio 12k Flex	Applied Biosystems	Yes	FAM	CIV-550	TAMRA	CAL Fluor Red 610		
QuantStudio Absolute Q	Applied Biosystems	Yes	FAM	CIV-550	TAMRA	ROX	Quasar 670	
StepOnePlus™	Applied Biosystems	Yes	FAM	CIV-550	TAMRA			
StepOne™	Applied Biosystems	Yes	FAM	CIV-550				
ViiA™ 7	Applied Biosystems	Yes	FAM	CIV-550	ROX	Quasar 670	Quasar 705	
Mic	Bio Molecular Systems	No	FAM	CAL Fluor Orange 560	CAL Fluor Red 610	Quasar 670	Quasar 705	
LineGene 9600 Plus	Bioer Technology	Yes	FAM	CIV-550	CAL Fluor Red 610	Quasar 670	Quasar 705	
LineGene K Plus	Bioer Technology	Yes	FAM	CIV-550	CAL Fluor Red 610	Quasar 670		
LineGene Mini S	Bioer Technology	Yes	FAM	CIV-550	CAL Fluor Red 610	Quasar 670		
QuantGene 9600	Bioer Technology	No	FAM	CIV-550	CAL Fluor Red 610	Quasar 670	Quasar 705	
CFX Connect™	Bio-Rad® Laboratories	Yes	FAM	CIV-550				
CFX Opus 96	Bio-Rad Laboratories	Yes	FAM	CIV-550	CAL Fluor Red 610	Quasar 670	Quasar 705	
CFX Opus 384	Bio-Rad Laboratories	Yes	FAM	CIV-550	CAL Fluor Red 610	Quasar 670		
CFX96 Touch™	Bio-Rad Laboratories	Yes	FAM	CIV-550	CAL Fluor Red 610	Quasar 670	Quasar 705	
CFX384 Touch™	Bio-Rad Laboratories	Yes	FAM	CIV-550	CAL Fluor Red 610	Quasar 670		
iCycler iQ®	Bio-Rad Laboratories	Yes	FAM	CIV-550	TAMRA	CAL Fluor Red 610	Quasar 670	
iQ™5	Bio-Rad Laboratories	Yes	FAM	CIV-550	CAL Fluor Red 590	CAL Fluor Red 610	Quasar 670	
QX One	Bio-Rad Laboratories	Yes	FAM	CIV-550	Quasar 670	Quasar 705		
QX200 Droplet Digital	Bio-Rad Laboratories	Yes	FAM	CIV-550				
Continuum	Dropworks (Bio-Rad Laboratories)	Yes	FAM	CIV-550	CAL Fluor Red 610	Quasar 670		
FLUOstar Omega Microplate Reader	BMG Labtech	No	FAM	CIV-550				
SmartCycler®	Danaher Corp. (Cepheid)	Yes	FAM	CAL Fluor Orange 560	CAL Fluor Red 610	Quasar 670		
SmartCycler II	Danaher Corp. (Cepheid)	Yes	FAM	CAL Fluor Orange 560	CAL Fluor Red 610	Quasar 670		
Mastercycler® ep Realplex	Eppendorf	Yes	FAM	CIV-550				
Biomark HD	Fluidigm®	Yes	FAM	CIV-550	ROX			
EP1	Fluidigm	Yes	FAM	CIV-550	ROX			
Eco™	Illumina®	Yes	FAM	CIV-550	CAL Fluor Red 610	Quasar 670		
MyGo Mini	IT-IS Life Science Ltd.	Yes	FAM	CAL Fluor Gold 540	CAL Fluor Red 610			
MyGo Pro	IT-IS Life Science Ltd.	No	FAM	CAL Fluor Gold 540	CAL Fluor Red 590	CAL Fluor Red 610	Quasar 670	Quasar 705
QIAcuity Digital PCR System	Qiagen	Yes	FAM	CIV-550	TAMRA	CAL Fluor Red 610	Quasar 670	
Rotor-Gene Q 2plex	Qiagen	No	FAM	CIV-550				
Rotor-Gene Q 5plex	Qiagen	No	FAM	CIV-550	CAL Fluor Red 610	Quasar 670	Quasar 705	
RainDrop Plus™	RainDance™ Technologies	No	FAM	CIV-550				
cobas® z 480	Roche	Yes	FAM	CAL Fluor Orange 560	CAL Fluor Red 610	Quasar 705		
LightCycler 2.0	Roche	Yes	FAM	CAL Fluor Red 610				
LightCycler 96	Roche	Yes	FAM	CIV-550	CAL Fluor Red 610	Quasar 670		
LightCycler 480	Roche	Yes	FAM	CIV-550	CAL Fluor Red 610	Quasar 670		
LightCycler 1536	Roche	Yes	FAM	CIV-550				
LightCycler Nano	Roche	Yes	FAM	CIV-550	CAL Fluor Red 610	Quasar 670		
Naica® dPCR System Prism3	Stilla®	Yes	FAM	CIV-550	Quasar 670			
Naica dPCR System Prism6	Stilla	Yes	FAM	CIV-550	TAMRA	CAL Fluor Red 610	Quasar 670	Quasar 705

* Some instruments may require fluorescence calibration. Please visit www.biosearchtech.com for more information.

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