



GeneBio
Systems, Inc.

PaCeR™ HP™ Family of Premium PCR DNA Polymerases

Robust Performance and High Fidelity

- PaCeR™ HP™ DNA Polymerase and Master Mix
- PaCeR™ II HP™ DNA Polymerase and Master Mix
- PaCeR (Phanta) Flash Master Mix



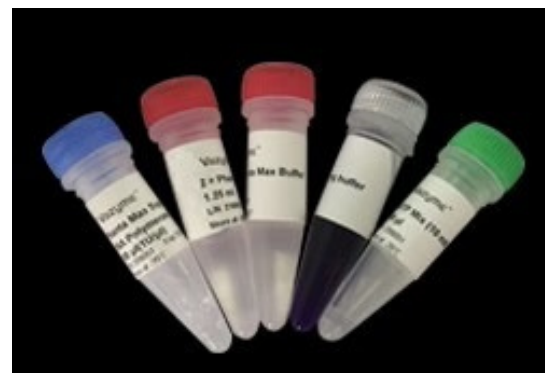
PaCeR™ HP™ DNA Polymerase and Master Mix (the Original PaCeR)

About PaCeR™

PaCeR™ High Performance (HP)™ DNA Polymerase is a new generation engineered enzyme derived from Pfu Polymerase for robust PCR with extremely high fidelity.

If you want to increase your success rate with PCR, we recommend PaCeR™:

- ✓ In vitro amplification of long fragments up to 40 kb λ DNA, 20 kb genomic DNA and 10 kb cDNA
- ✓ Ability to amplify DNA with GC-content as high as 85%
- ✓ High fidelity: 53-fold lower error rate compared to Taq and 6-fold lower compared to Pfu
- ✓ Fast extension rate: 1 sec / kb *extension rates vary based on sequence*
- ✓ Resistant to PCR inhibitors
- ✓ Can be used for direct PCR using bacteria, fungi, plants, animal tissues, and whole-blood samples



- ✓ Protein engineering led to a unique enzyme with an extension factor, a specificity-promoting factor and a plateau-inhibiting factor
- ✓ Validated hot start technology, with two monoclonal antibodies
- ✓ Inherent 5'-3' polymerase activity, 3'-5' exonuclease activity. resulting in blunt- ended products (compatible with all blunt-end cloning kits)

Regular and other robust PCR DNA polymerases such as Taq, Phusion®, KOD



ORDERING INFORMATION

CAT.#	PRODUCT	QUANTITY	PRICE (\$)
PCR-003-01	2x PaCeR™ HP™ Master Mix 2x	1 mL	153.68
PCR-003-02	PaCeR™ HP™ Master Mix 2x	5 mL	621.70
PCR-003-03	PaCeR™ HP™ Master Mix	15 mL	1397.09
PCR-001-01	PaCeR™ HP™ DNA polymerase	100 U	119.07
PCR-001-02	PaCeR™ HP™ DNA polymerase	500 U	523.91
PCR-001-03	PaCeR™ HP™ DNA polymerase	1000 U	1011.53

CONTACT US

Order: order@genebiosystems.com

Support: TechSupport@genebiosystems.com

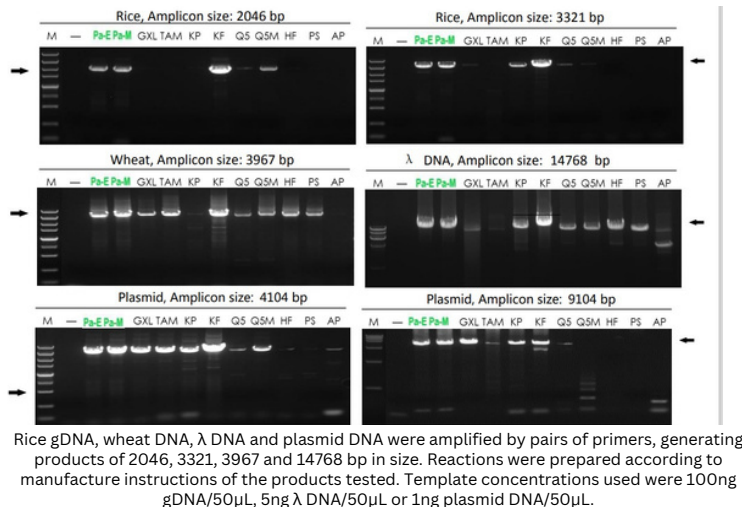
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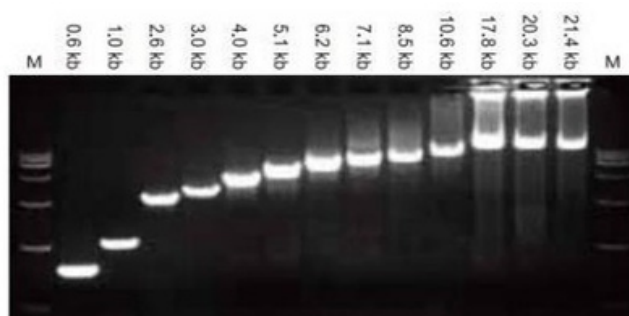


PaCeR™ HP™ DNA Polymerase and Master Mix (the Original PaCeR)

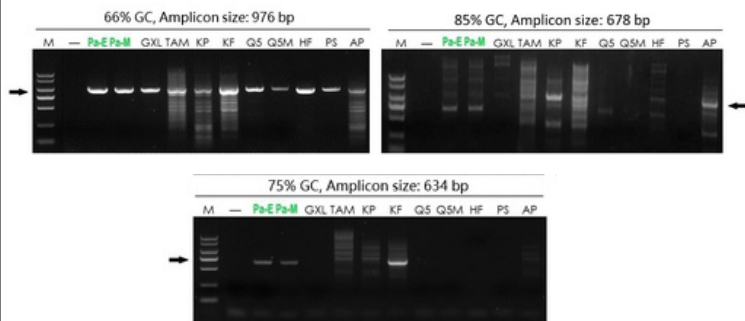
PaCeR™ Amplifies More Targets Compared To Other Robust Polymerases



PaCeR™ Enables Consistent Long PCR Amplification

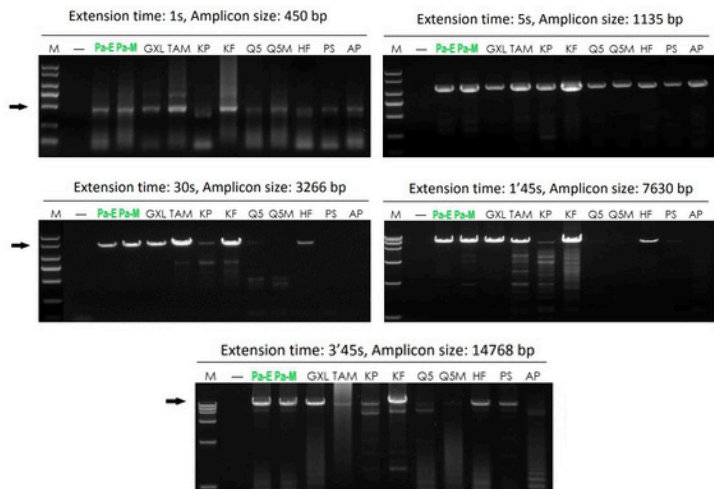


PaCeR™ Can Amplify Targets With Up To 85% GC-Content



50ng human genomic DNA regions of 976, 634, and 678bp in size, with 66, 75 and 85% GC-content, respectively, were amplified. Instructions provided by each manufacturer were followed. Enhancers were added, when recommended by manufacturers, including GeneBio Systems' Cat. # PCR-001 and PCR-002.

PaCeR™ Is a Fast DNA Polymerase



100ng genomic DNA or 5ng λ DNA/50μL were used to amplify products in sizes, as indicated. Extension times were as indicated.

GUIDE TO POLYMERASES COMPARED ABOVE

Polymerase Abbreviation

Pa-E	PaCeR™ HP™ DNA Polymerase (GeneBio # PCR-001)
Pa-M	2X PaCeR™ HP™ Master Mix (GeneBio # PCR-002)
GXL	PrimerSTAR® GXL DNA Polymerase (Takara # R050A)
TAM	PrimerSTAR® Max DNA Polymerase (Takara # R045A)
KP	KOD-Plus-Neo (TOYOBO # KOD-401)
KF	KOD-FX-Neo (TOYOBO # KFX-201)

Polymerase Abbreviation

Q5	Q5® Hot Start High-Fidelity DNA Polymerase (NEB # M0493S)
Q5M	Q5® Hot Start High-Fidelity 2X Master Mix (NEB # M0494S)
HF	Phusion Green Hot Start II High-Fidelity DNA Polymerase (Thermo # F537S)
PS	Platinum™ SuperFi™ DNA Polymerase (Invitrogen # 12351010)
AP	AccuPrime™ Pfx DNA Polymerase (Invitrogen # 12344024)

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PaCeR™ II HP™ DNA Polymerase and Master Mix

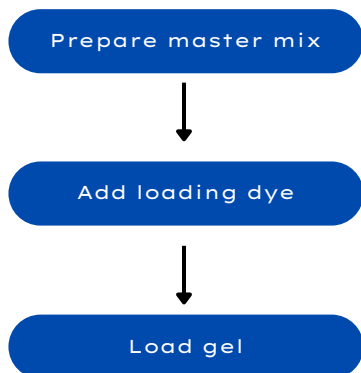
About PaCeR II™

PaCeR II™ High Performance (HP)™ DNA Polymerase is a new generation engineered enzyme derived from Pfu DNA Polymerase for robust PCR with extremely high fidelity. Built on the proven success of PaCeR, PaCeR II adds **extreme freeze-thaw stability (tolerates at least 15 cycles)** and **pre-spiked gel loading dye** for direct agarose gel loading without additional buffer. If you want to increase your success rate with PCR while gaining convenience and flexibility, we recommend PaCeR™ II:

Specification	PaCeR II
Extension rate	✓ Up to 12 kb/min
Freeze-thaw stability	✓ At least 15 cycles
Gel loading dye	✓ Pre-spiked, ready to load

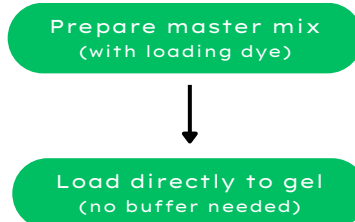


PaCeR™ I



Why PaCeR™ II Changes Your Workflow

PaCeR™ II advantage



15+ reuses from one prep

- ✓ Save time
No repeated prep
- ✓ Reduce errors
Fewer pipette steps
- ✓ Cost efficient
Reuse 15+ times
- ✓ Convenient
Direct gel loading

ORDERING INFORMATION

CAT.#	PRODUCT	QUANTITY	PRICE (\$)
PCR-003-01	PaCeR™ II HP™ DNA Polymerase	1 mL	153.68
PCR-003-02	PaCeR™ II HP™ DNA Polymerase	5 mL	621.70
PCR-003-03	PaCeR™ II HP™ DNA Polymerase	15 mL	1397.09

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GeneBio
Systems, Inc.™



2 × PaCeR (Phanta) Flash Master Mix

PaCeR™ Flash utilizes the new generation of Phanta Flash Super-Fidelity DNA Polymerase. Through the directed evolution of Phanta DNA Polymerase, Phanta Flash Super-Fidelity DNA Polymerase is high fidelity (mismatch rate is 1/106 of conventional Taq DNA polymerase) and rapid amplification (5 sec/kb).

- ✓ High fidelity: ~106X higher than Taq DNA Polymerase
- ✓ Flash amplification: Extension time up to 5 sec/kb
- ✓ Robust performance: Superior specificity, sensitivity, and yields
- ✓ Broad compatibility: Suitable for complex samples & GC-rich

content



■ Ultra-fast Amplification

2 × PaCeR Phanta Flash Master Mix (P510), 2 × PaCeR Phanta Flash Master Mix (Dye Plus) (P520), and other commercially available brands of high-fidelity polymerases were used to perform PCR amplification. The target fragments of 353 bp and 873 bp were amplified at an extension time of 1 sec/kb; the 7140 bp fragment was amplified at an extension time of 4 sec/kb and 5 sec/kb, respectively. The results show that all the fragments could be successfully amplified by P510 and P520.



ORDERING INFORMATION

CAT.#	PRODUCT	QUANTITY	PRICE (\$)
P510-01	2 × PaCeR (Phanta) Flash Master Mix	1 mL	160.68
P510-02	2 × PaCeR (Phanta) Flash Master Mix	5 mL	650.01

CONTACT US

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PaCeR™ Original, PaCeR™ II and PaCeR Flash are premium PCR enzymes you can rely on

SELECTED CUSTOMER TESTIMONIALS

"Until we tried PaCeR, we were unable to amplify a large, highly repetitive CRISPR array in one of our bacterial genomes using a variety of enzymes, primers, and approaches. Remarkably, PaCeR amplified this problematic array accurately and robustly with very minimal optimization - in other words, the enzyme was the difference"

Professor Alex Ensminger, University of Toronto, Ontario, Canada

"After continued difficulty amplifying a 4 kb viral genome fragment using a variety of well-known high fidelity polymerases, the only solution I found was using PaCeR. It not only amplified what other products were unable to but amplified it to a great degree. Additionally, being a high-fidelity polymerase, the error rates were very low. This has become my polymerase of choice for molecular cloning. The price is very affordable and the representatives are incredibly helpful."

Ms. Olivia Roscow, Professor Baozhong Meng Lab, University of Guelph, Ontario, Canada

"The bacterial Bst DNA polymerase gene construct we wanted to amplify was 3.5 kb and we could not amplify it using commercial Taq and Pfu DNA polymerases. After trying the 2x PaCeR master mix, we could see the band after the first experiment and by the way the yield was high-a bright band on gel"

Professor Frank Merante, Seneca College, Toronto, Ontario, Canada

"We were amplifying a 9 kb gene using Phusion without success and were presented with the PaCeR enzyme. We were able to amplify this construct in one piece right away, using the same primers."

Professor Georgina Cox, University of Guelph, Ontario, Canada.

Publications Cited The Use of PaCeR™ HP™ DNA Polymerase

Deecker, S. R. and Ensminger, A. W (2020) Type I-F CRISPR-Cas distribution and array dynamics in *Legionella pneumophila*. G3 (Bethesda). 2020 Jan 14. pii: g3.400813.2019. doi: 10.1534/g3.119.400813.

Roscow, O.M.A. (December, 2019) Olivia M. A. Roscow, Development of a Full-Length Infectious Clone of Grapevine rupestris stem pitting-associated virus strain Syrah and GFP-Tagged and VIGS Vectors for *Vitis vinifera*. Master of Science Thesis, University of Guelph, 2019.

WE HAVE CONCLUDED...

PaCeR™ Original, PaCeR™ II, and PaCeR Flash have:

- ✓ Demonstrated advantages over other products from various companies in all key performance tests
- ✓ Suitable as the one-for-all applications PCR enzyme in demanding PCR experiments
- ✓ Excelled in a) direct PCR with crude sample lysates, and b) assay development where low template concentrations are required (data not shown)

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