TECHNICAL NOTE

Performance Evaluation of Norgen's HPV (High-Risk) Taqman® PCR Detection Kit

HPV Detection From HeLa & SiHa Cells

INTRODUCTION

Human papillomavirus (HPV) includes over 70 genotypes, of which types 16 and 18 are classified as high-risk due to their association with cervical cancer. PCR-based detection enables sensitive and specific identification of these high-risk types. Norgen's HPV (High Risk) TaqMan® PCR Kit (SKU TM32250) offers a multiplex format targeting both HPV 16 and HPV 18 with real-time PCR readout.

This technical note demonstrates the performance characteristics of the assay using quantified standards and biologically relevant cell line controls.

Kit Name:
HPV (High-Risk) TaqMan® PCR Detection Kit

Kit SKU:
TM32250

Experimental Targets:
HPV 16 (FAM) &
HPV 18 (Cy5)

METHODS & MATERIALS

Template DNA:

- Purified HPV plasmid standards
- Genomic DNA from HeLa (HPV18) and SiHa (HPV16) cell lines
- Negative (NTC) and positive controls per kit protocol

Standard curves were generated from serial dilutions of known copy numbers of HPV 16 and HPV 18. Biological validation was done with DNA extracted from 2×10^6 cells.

RESULTS & DISCUSSION

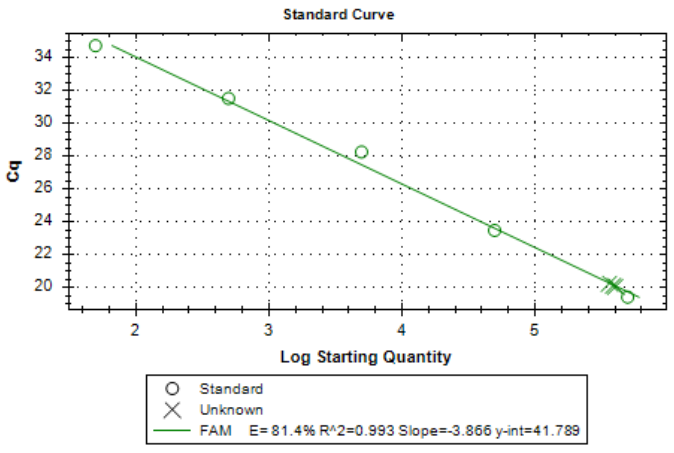

Figure 1: Standard Curve for HPV16.

The amplification curve for HPV 16 demonstrates excellent linearity across 5 orders of magnitude (4.96×10^5, 10^4, 10^3, 10^2, 10^1 copies). $R^2 \approx 0.993$.

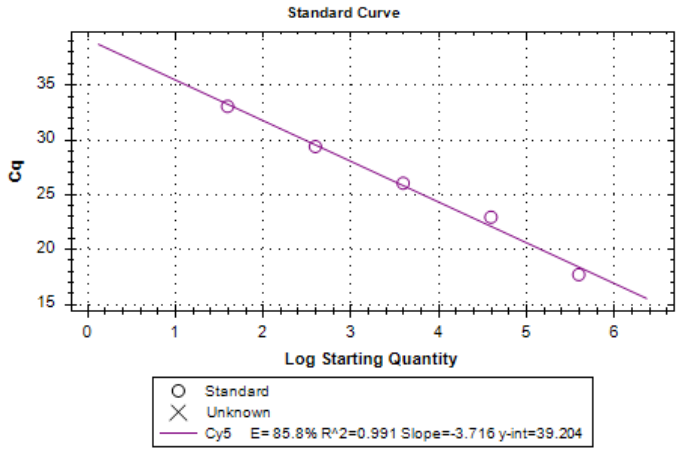

Figure 2: Standard Curve for HPV18.

The amplification curve for HPV 18 demonstrates excellent linearity across 5 orders of magnitude (3.92×10^5, 10^4, 10^3, 10^2, 10^1 copies). $R^2 \approx 0.991$.

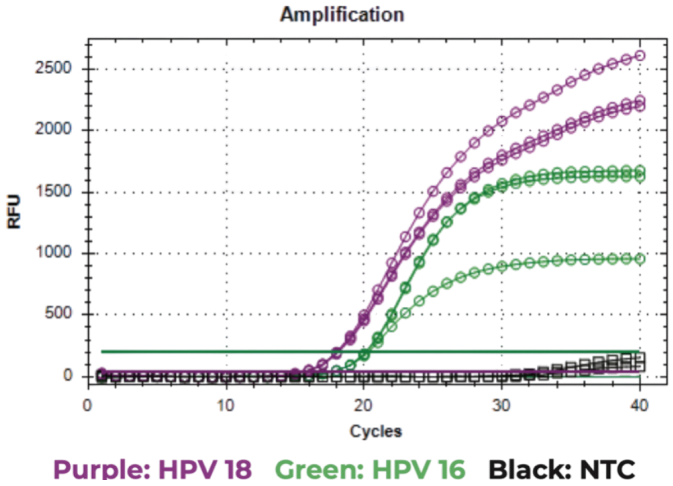

Figure 3: HPV18 (HeLa) and HPV16 (SiHa) Quantification.

Representative plots show strong, early amplification for both HPV 16 (green/FAM; Ct ($\bar{x}$) = 20.19 ± 0.10) and HPV 18 (purple/Cy5; Ct ($\bar{x}$) = 15.63 ± 0.12). No amplification was observed in non-template controls (NTCs, black) across all channels, while internal HEX signals (not shown) were consistently detected, confirming reaction integrity and the absence of inhibitors.

Genome Copy Benchmarking (Biological Matrices)

Cell Line	HPV Type	Genome Copies (from 2 × 10^6 cells)
HeLa	HPV 18	1.39 × 10^7
SiHa	HPV 16	2.41 × 10^6

These results confirm accurate and quantitative detection in real-world biological samples.

CONCLUSION

Norgen's HPV (High Risk) TaqMan® PCR Kit reliably detects and quantifies HPV types 16 and 18 with:

- **Limit of Detection:** ~10 copies/reaction
- **Dynamic Range:** 5 logs
- **Efficiency:** Slope = –3.87 (HPV-16), –3.72 (HPV-18); Efficiency ≈ 81–86 %
- **Linearity:** $R^2 > 0.99$
- **Specificity:** No amplification in NTC; HEX internal control confirms sample integrity

Norgen's HPV (High Risk) TaqMan® PCR Kit (TM32250) provides a rapid, sensitive, and quantitative method for detecting the two most oncogenic HPV genotypes.