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MDPI

Supplementary Materials

Development of an HPV Genotype Detection Platform Based on Aggregation-Induced Emission (AIE) and Flow-Through Hybridization Technologies

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Table S1. Amplification Program.

Stage	Temperature	Time Period
Initialization	95 °C	9 min
Cycle (40 rounds)	95 °C	20 sec
	55 °C	30 sec
	72 °C	30 sec
Hold	72 °C	5 min
	4 °C	-

Table S2. Denaturation Program.

Stage	Temperature	Time Period
Initialization	95 °C	5 min
Hold	95 °C	-

Table S3. Composition of Reagents.

Reagents	Composition
Sample Preservation Solution	Sodium hydrogen phosphate, sodium chloride, purified water
Solution I	Tris(hydroxymethyl)aminomethane (Tris), sodium chloride, EDTA, sodium hydroxide, SDS, purified water
Solution II	isopropanol
Solution III	Sterile purified water
PCR Mix	Tris-HCl buffer, magnesium chloride, >3% dATP, dCTP, dGTP and dTTP,<3% synthetic oligonucleotide primers, <0.2 % non-infectious plasmid DNA (for internal control)
DNA Taq Polymerase	DNA Polymerase (5U/μL), stabilizer
Positive Control	Tris-HCl buffer, EDTA, <0.01% non-infectious plasmid DNA (HPV-18)
Hybridization Solution	0.1% SDS solution
Solution A	Tris-buffer, 0.05% sodium azide
Solution B	<0.5% SDS solution
Blocking Solution	PBS, <0.1 detergent
Enzyme Conjugate	<0.0003% Streptavidin-ALP conjugate, Stabilizer
BCIP/NBT	1-5% (w/w) BCIP/NBT
HybriMem	Nylon membrane coated with specific HPV DNA probes

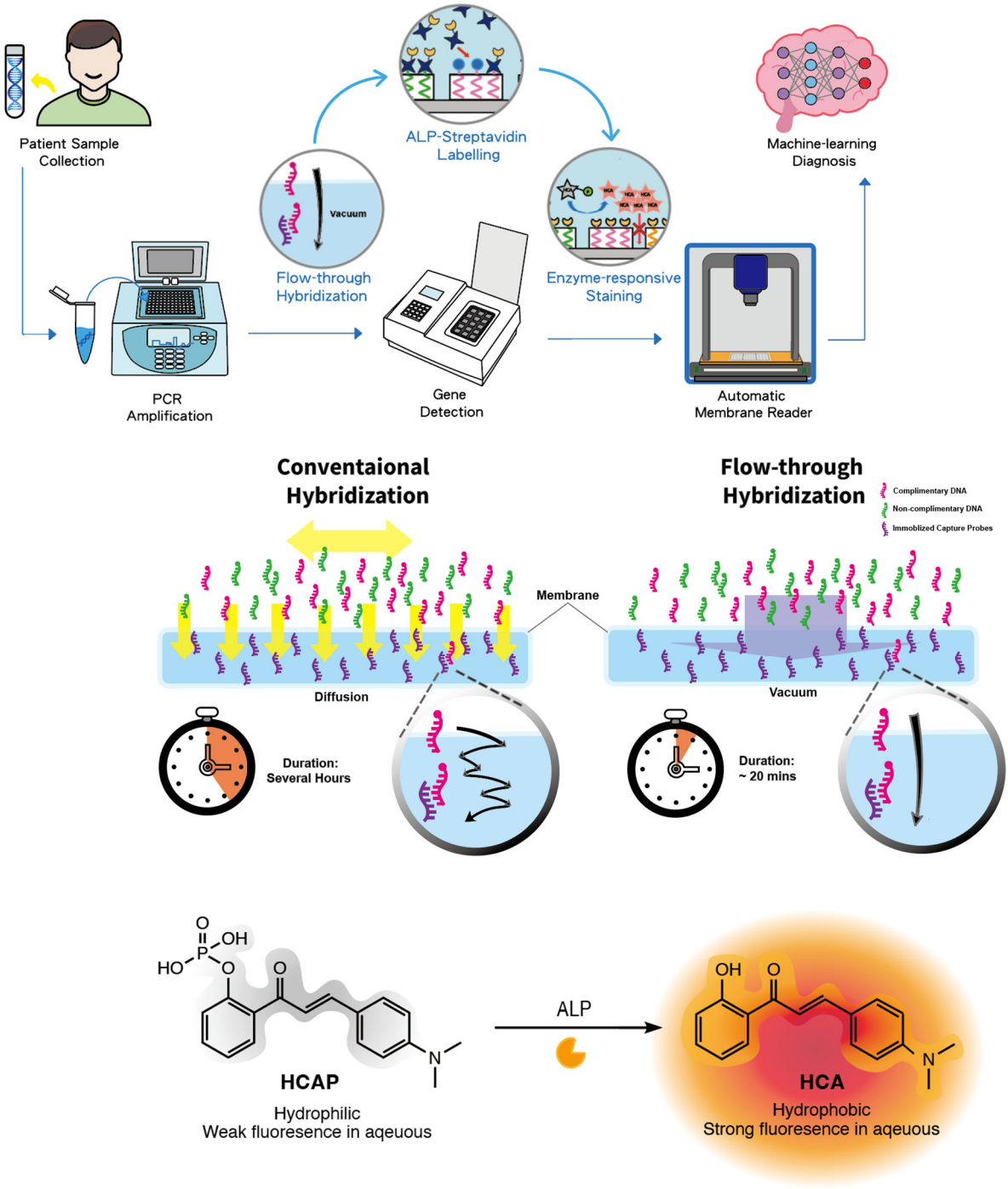


Figure S1. The general workflow of the HPV genotype detection platform based on aggregation-induced emission (AIE) and flow-through hybridization technologies.

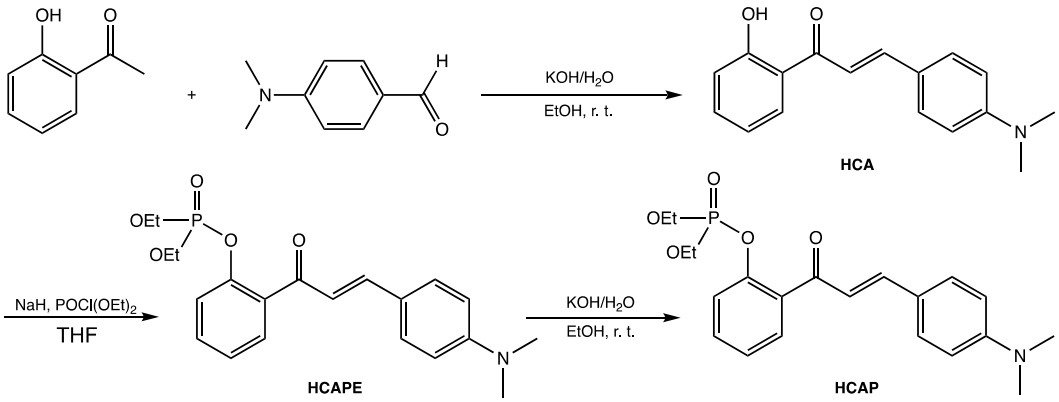


Figure S2. Synthetic route of HCAP.

HybriMem, is a porous membrane of nylon coated with 21 different high risk HPV type-specific oligonucleotide sequences probes. Capture probes with different oligonucleotide sequences are immobilized on the HybriMem on each array except biotin and internal control.

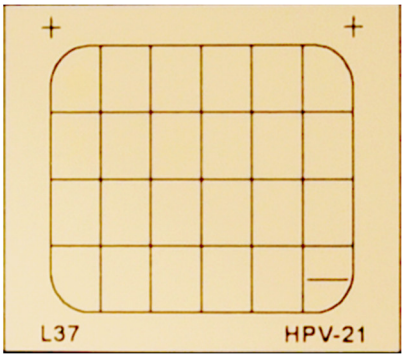


Figure S3. The image of HybriMem in the 21 HPV GenoArray Diagnostic Kit.

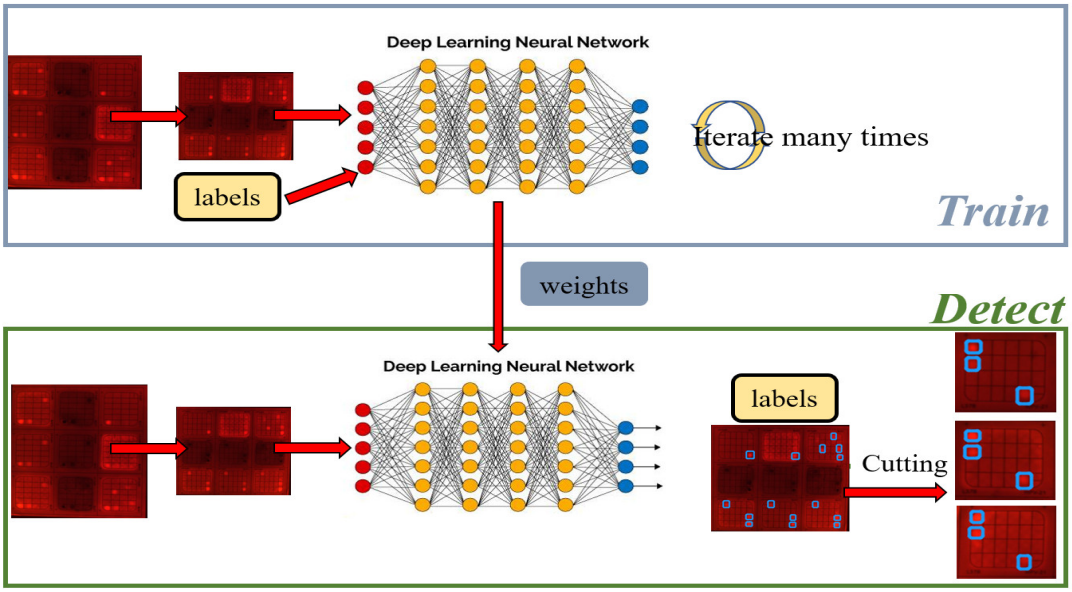


Figure S4. Schematic diagram of training the deep learning neural network for the machine learning diagnosis of the automatic membrane reader.

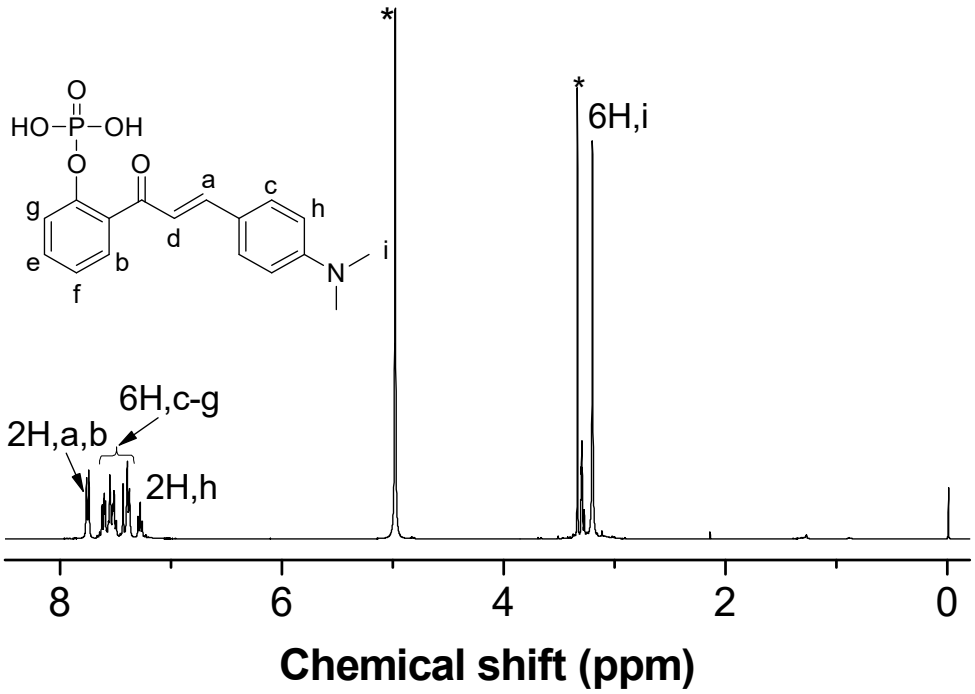


Figure S5. ^{1}H NMR spectrum of HCAP in CD_3OD.

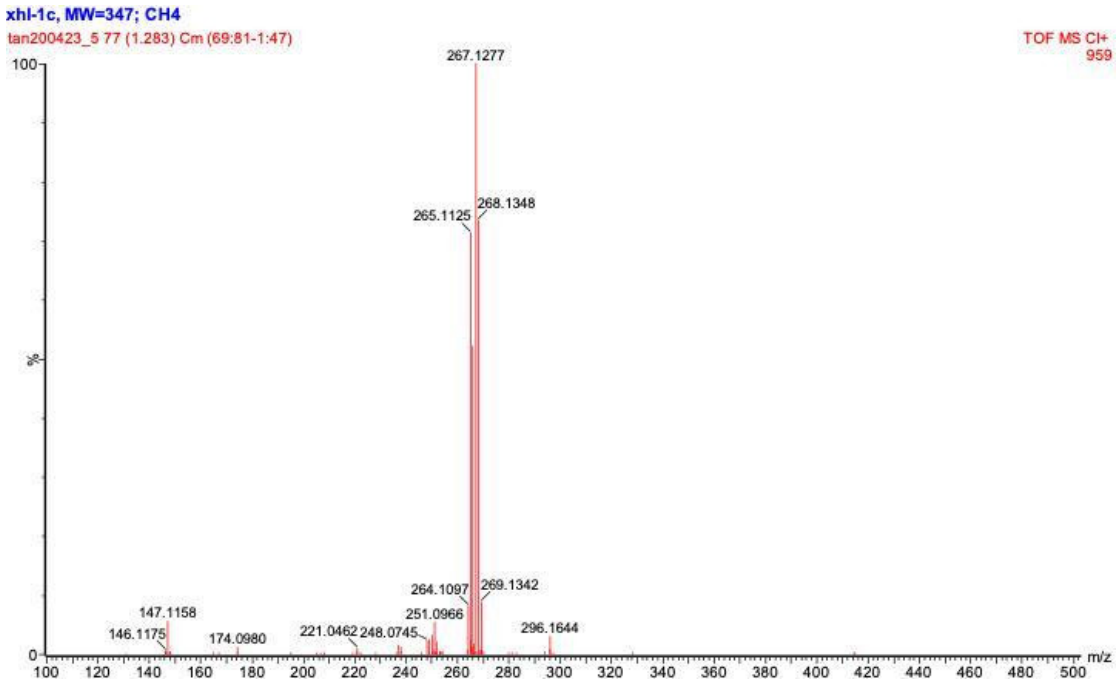


Figure S6. The mass spectrum of HCAP.