Supplementary Data

Supplementary Table. 1: Comparison of techniques reported for virus detection

S. No	Technique	Cost	Time	Highlights	Limitations	References
1	Plaque assay	Cost effective	1-2 weeks	High sensitivity	Time consuming, Operator dependent,	[1]
2	RT-PCR technique	High cost	2-4 hours	High sensitivity	High workload, Reagent shortage during epidemic	[2-4]
3	LAMP	Cost effective	30 minutes	Rapid, simple, high sensitivity and specificity	High chance of false positive results due to pH indicators	[5-7]
4	SHERLOCK	Cost effective	Rapid detection	No need of bulky instrumentation, sensitive and specific virus detection	Great chance of sample contamination	[6, 8, 9]
5	DETECTR	Cost effective	<40 minutes	Rapid, Easy to implement, Accurate	Need prior nucleic acid extraction and several physical procedures	[9]
6	FET based biosensors	Low cost	Few minutes	Highly sensitive and specific detection. No cross reactivity to MERS-CoV Antigen.	High quality graphene synthesis with identical parameter is a challenge	[10]
7	ELISA	Cost effective	Few hours	High-throughput detection, Easily	Professional skills are needed,	[11, 12]

				available, Helpful for disease prognosis and prevalence	Moderate accuracy	
8	Electrochemical biosensor	Low cost	10 to 30 seconds	Portable, High sensitivity, Used for bedside/on-site PoC diagnostics, minimum sample volume	Limited shelf life, Experts are needed, Interference to sample matrix	[13, 14]
9	CT Scan	High cost	30 minutes	Non-invasive	Low specificity, Expert is required for the operation,	[15, 16]

Supplementary Table 2. Raman spectroscopy for the detection of different types of viruses

S. No.	**Method**	**Sample**	**Disease/ Virus**	**LOD/Sensitivity**	**Specificity**	**Year/ References**
1	Ultraviolet Resonance Raman Spectroscopy	Buffer solution	Filamentous Virus fd	438 µg/ml	-	[17]
2	Ultraviolet Resonance Raman spectroscopy	Buffer solution	Pf1 (class II Filamentous Virus), fd virions	2052 µg/ml	-	[18]
3	Raman tweezers	Cell culture supernatants	Kaposi's Sarcoma-associated Herpes	-	-	[19]

			Virus (KSHV)			
4	SERS	MHN Buffer Solution	Respiratory Virus	100 PFU/ml	-	[20]
5	SERS	Serum-free DMEM	Respiratory Syncytial Virus (RSV)	-	-	[21]
6	Near Infrared Raman spectroscopy	Human blood serum	Hepatitis C	92%	88%	[22]
7	Raman spectroscopy	Human blood serum	Dengue Virus	-	-	[23]
8	SERS	Buffer	Coxsackievirus, Respiratory Syncytial Virus, E. coli, and B. cereus	-	-	[24]
9	TERS	Infected plant	Tobacco Mosaic Virus	-	-	[25]
10	SERS	-	Rotavirus	$\sim 10^4$ ffu/mL	100%	[26]
11	TERS	-	Avipoxvirus and Adenoassociated Virus	-	-	[27]
12	SERS	PBS sample	Rift Valley Fever Virus (RVFV) and West	WNV= 0.02 µM RVFV= 0.1 µM	-	[28]

			Nile Virus (WNV)			
13	Raman spectroscopy	Serum and whole blood	Dengue Virus	-	-	[29]
14	SERS	Tris buffer	AIV PB1-F2 Protein	~0.01 μM	-	[30]
15	Raman spectroscopy	Human embryonic kidney epithelial (HEK293) cells	Adenovirus	-	-	[31]
16	Raman spectroscopy and advanced statistical methods	African green monkey kidney (Vero) cells	Herpes Simplex Virus type 1 (HSV-1)	100%	-	[32]
17	SERS	Human blood	Hepatitis B Virus	0.01 IU/mL	-	[33]
18	SERS	DMEM	Human Immunodeficienc Virus (HIV-1 Virus)	3.5×10^{-8} μg/mL	-	[34]
19	SERS	PBS	Influenza Virus (H_1N_1)	-	-	[35]
20	TERS	-	Varicella-zoster Virus (VZV) and Porcine	-	-	[36]

			Teschovirus (PTV)			
21	SERS	PBS sample	Enterovirus 71 protein	10^5 PFU/mL	-	[37]
22	SERS	Saliva	Salivary NS1	96.9%	100%	[38]
23	SERS-LFIA	Serum sample	Zika and Dengue Viruses	0.00072 µg/mL of ZIKV NS1 and 0.00767 µg/mL of DENV NS1	-	[39]
24	SERS	Human serum	H5N1	7.4×10^{-5} µg/mL		[40]
25	Raman spectroscopy	human embryonic kidney 293 (HEK293) cells	Adenovirus	-	-	[41]
26	SERS	PBS sample	Zika virus, NS1 Antigen	0.01 µg/mL	-	[42]
27	SERS	Serum	Hepatitis B Surface Antigen (HBsAg)	5×10^{-8} µg/mL	-	[43]
28	SERS	Serum	Hepatitis B	91.4%	83%	[44]
29	SERS-based LFIA	Human blood Serum	Influenza A H1N1 Virus and Human Adenovirus (HAdV)	H1N1=50 PFU/mL HAdV= 10 PFU/mL,	-	[45]

30	TERS	-	Influenza Virus and Picornavirus	-	-	[46]
31	AFM-IR, TERS	TNE Buffer	Herpes Simplex Type 1 Virus(HSV-1)	-	-	[47]
32	SERS	Blood serum	Hepatitis C Virus	-	-	[48]
33	SERS	Nasopharyngeal swabs	Rhinovirus, Influenza Virus, and Parainfluenza Viruses	10^2 $EID_{50}/\mu L$ (50% egg infective dose per microliter)	90%	[49]
34	SERS	HeLa cell lysate	Influenza A Virus	-	-	[50]
35	Raman spectroscopy	Human glial cells	Epstein-Barr Virus	-	-	[51]
36	SERS	Peripheral blood mononuclear cells (PBMCs)	Human Immunodeficiency Virus (HIV-1)	10^2 to 2×10^5 copies/mL	84.8%	[52]
37	Raman spectroscopy	Human saliva	RNA virus	92.5%	88.8%	[53]
38	SERS imaging-based aptasensor	Virus titre solution	Influenza Virus A (H1N1, H3N2)	97 PFU/mL	-	[54]
39	SERS	Blood serum	Dengue	-	-	[55]
40	SERS	Blood	Hepatitis C Virus	-	-	[56]

41	Raman spectroscopy	Serum	Hepatitis	-	94.54 %	[57]
42	SERS Immunochromatographic Assay (ICA)	Clinical feces samples	Rotavirus	8×10^{-6} μg/mL	-	[58]
43	SERS	PCR products	Hepatitis B	89%	98%	[59]
44	Raman Spectroscopy	Blood plasma	Hepatitis B	100%	99.25 %	[60]
45	Raman	Cell cultures	Porcine Parvovirus	95.55% to 97.77%	100%	[61]

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