Series 300
BioSpot-VIVAS™ Bioaerosol Sampler

Aerosol Devices Inc

The Series BSS300 BioSpot-VIVAS bioaerosol sampler uses a laminar-flow water condensation particle growth technique for high efficiency collection of bioaerosols (<10nm to 10µm) sampling directly into a liquid medium.

- ✓ ***High efficiency collection – viruses, bacteria, spores, toxins, exhaled proteins***
- ✓ ***Concentrated samples into liquid***
- ✓ ***Maintains viability***
- ✓ ***Instant preservation of DNA/RNA for genomic analysis***

The BioSpot-VIVAS sampler performs much like the human lung, providing high-efficiency, gentle collection into liquid through condensation-enhanced inertial deposition. A laminar-flow condensation growth tube (CGT) encapsulates airborne particles into liquid droplets and gently deposits the droplets onto a liquid surface. The air sample flow is 8 L/min, approximating the average rate at which a person breathes. Particles from this flow are deposited into ~2mL of water, buffer, genomic preservative or nutrient broth solution. Bioaerosols, including viable viruses, bacteria, fungal spores, toxins, and exhaled proteins are collected with high efficiency. The air sample temperature is moderate, never exceeding 40°C, while the liquid sample matrix has user-selectable temperature control from ambient down to 10°C. The high-fidelity, concentrated samples are ready for lab analysis.

Applications

- Airborne disease transmission
- Environmental microbiome
- Infectious disease surveillance in public, transportation, medical and agricultural settings
- Biocontamination monitoring in clean pharmaceutical aseptic manufacturing
- Defense/Homeland Security bio-surveillance
- Non-invasive medical diagnostics of exhaled breath particulate condensate

Model BSS300-P Specifications

Particle Size Range	5nm to >10µm
Collection Efficiency	>90% for hydrophobic and hydrophilic particles
Collection medium	Water, buffer, genomic preservative or nutrient broth
Condensing Fluid	Water (distilled or cleaner)
Wick Material	DVPP00010 Durapore® Membrane Filter (Millipore Sigma)
Sample Flow Rate	8 L/min
Sampled Aerosol Conditions	Non-corrosive 0 – 40 degrees C
Collection Reservoir	Collection into a 35 mm x 11 mm petri-dish
Display	LCD display, 4 lines x 20 characters
Communications	RS-232 communications output for sampling parameters and instrument status, USB-connectable to computers
Sample Inlet	10 mm OD SS tube
Power	85-264 VAC, 47-63 Hz
Dimensions	760 mm (H) x 485 mm (W) x 370 mm (D) (30 x 19 x 14.5 inches)
Weight	29.5 kg/ 65 lbs

Competing Aerosol Collection Technology

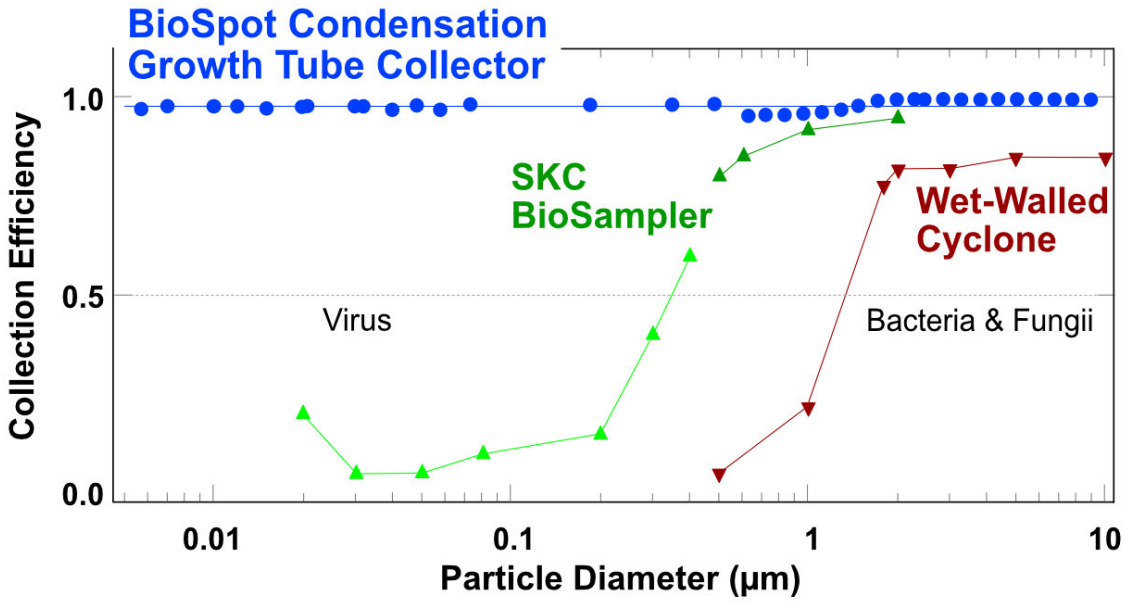

Figure 1. Collection efficiency as a function of particle size for various bioaerosol sampler technologies (Hogan et al. 2005, Willeke et al. 1998, McFarland et al. 2010, and Lednicky et al. 2016).

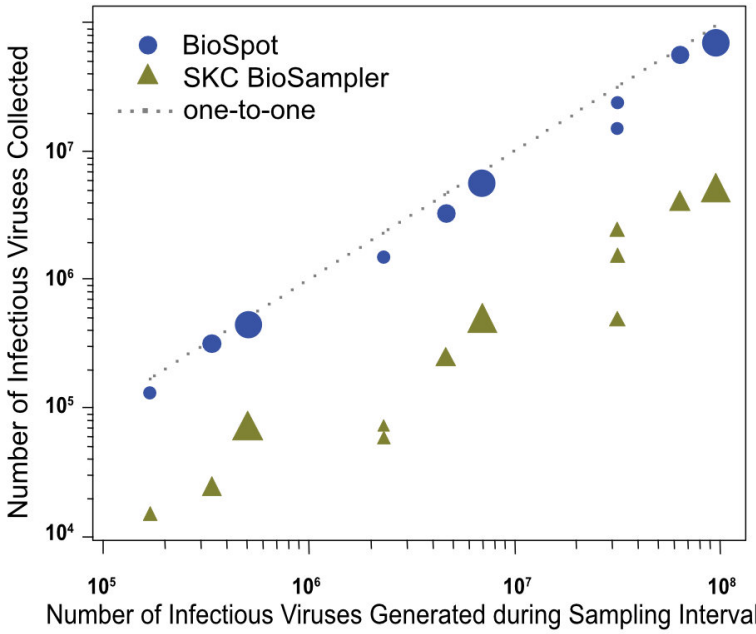

Figure 2: Influenza H1N1 virus (2009)—Number of infectious viruses collected as a function of the number of aerosolized infectious viruses generated (Lednicky et al. 2016).

References

Pan, M., L. Carol, J.A. Lednicky, A. Eiguren-Fernandez, S. Hering, Z. Hugh Fan, and C.-Y. Wu. (2018) Collection of airborne bacteria and yeast through water-based condensational growth. *Aerobiologia*. 34, 337-348 DOI:10.1007/s10453-018-9517-7

Lednicky, J., M. Pan, J. Loeb, H. Hsieh, A. Eiguren-Fernandez, S. Hering, Z. Hugh Fan & C.-Y. Wu. (2016) Highly efficient collection of infectious pandemic Influenza H1N1 virus (2009) through laminar-flow water based condensation, *Aerosol Science and Technology*, 50:7, i-iv, DOI:10.1080/02786826.2016.1179254

Pan, M., A. Eiguren-Fernandez, H. Hsieh, N. Afshar-Mohajer, S.V. Hering, J. Lednicky, Z. Hugh Fan and C.-Y. Wu. (2016) Efficient collection of viable virus aerosol through laminar-flow, water-based condensational particle growth, *Journal of Applied Microbiology*, 120:3, 805 -815, DOI:10.1111/jam.13051

Who We Are

A team of engineers and scientists passionate for revolutionizing the science of airborne particle counting and collection for physical, chemical and biological analysis. Aerosol Devices Inc. was formed in 2014 by Ms. Pat Keady and Dr. Susanne Hering, both past Presidents of the American Association for Aerosol Research (AAAR) and leaders in the field with numerous aerosol measurement patents and publications.

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