Supplementary Online Material (SOM) for:

Ambient measurements of biological aerosol particles near Killarney, Ireland: a comparison between real-time fluorescence and microscopy techniques

D. A. Healy[1#*], J. A. Huffman[2, 3*], D. J. O'Connor[1], C. Pöhlker[3], J. Schneider[3], U. Pöschl[3] and J. R. Sodeau[1]

[1]University College Cork, Department of Chemistry and Environmental Research Institute, Cork, Ireland

[2]University of Denver, Department of Chemistry and Biochemistry, Denver, Colorado, USA

[3]Max Planck Institute for Chemistry, Multiphase Chemistry and Biogeochemistry Departments, Mainz, Germany

[#]Now at Pepsico, Global Quality Services, Little Island, Cork, Ireland.

*Corresponding authors: d.healy@ucc.ie; alex.huffman@du.edu

References:

Huffman, J. A., Treutlein, B. and Pöschl, U.: Fluorescent biological aerosol particle concentrations and size distributions measured with an Ultraviolet Aerodynamic Particle Sizer (UV-APS) in Central Europe, Atmospheric Chemistry and Physics, 10, 3215-3233, 2010.

Table S1. The size bin parameters shown for 52 particle size bins used to classify particle size data as measured by WIBS-4 and UV-APS. $D_{o(median)}$ shows the geometric median value of the upper and $D_{o(lower\ limit)}$ shows lower range for optical particle diameter of each size bin. Bins are matched to UV-APS bins, as discussed in Supplemental Table S1 in Huffman et al. (2010).

Channel #	$D_{o\ (median)}$ (µm)	$D_{o\ (lower\ limit)}$ (µm)
1	0.542	0.523
2	0.583	0.562
3	0.626	0.604
4	0.673	0.649
5	0.723	0.697
6	0.777	0.749
7	0.835	0.805
8	0.898	0.865
9	0.965	0.93
10	1.037	0.999
11	1.114	1.074
12	1.197	1.154
13	1.286	1.24
14	1.382	1.333
15	1.486	1.432
16	1.596	1.539
17	1.715	1.654
18	1.843	1.777
19	1.981	1.91
20	2.129	2.052
21	2.288	2.205
22	2.458	2.37
23	2.642	2.547
24	2.839	2.737
25	3.051	2.941
26	3.278	3.16
27	3.523	3.396
28	3.786	3.65
29	4.068	3.924
30	4.371	4.217
31	4.698	4.532
32	5.048	4.87
33	5.425	5.233
34	5.829	5.623
35	6.264	6.043
36	6.732	6.494
37	7.234	6.978
38	7.774	7.499
39	8.354	8.059
40	8.977	8.66
41	9.647	9.306
42	10.37	10.002
43	11.14	10.748
44	11.97	11.548
45	12.86	12.402
46	13.82	13.338
47	14.86	14.332
48	15.96	15.4
49	17.15	16.539
50	18.43	17.773
51	19.81	19.099
52	20	—

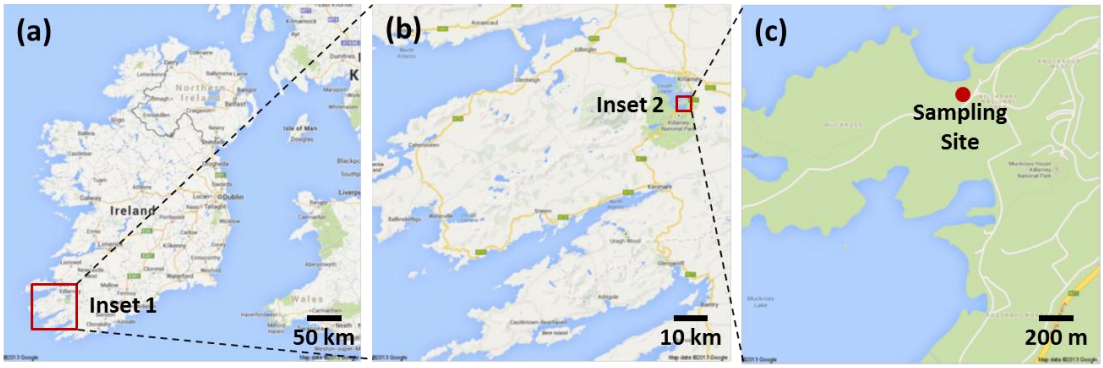

Figure S1. Location of sampling site in Killarney National Park, Ireland shown in three successive zoom levels. Red boxes in (a) and (b) show area of zoom for plot immediately to right. Approximate scale bars are shown in lower right of each panel. Sampling location shown as red dot in panel (c): N 52°01.263' W 09°30.553'. Map data copyright Google, 2013.

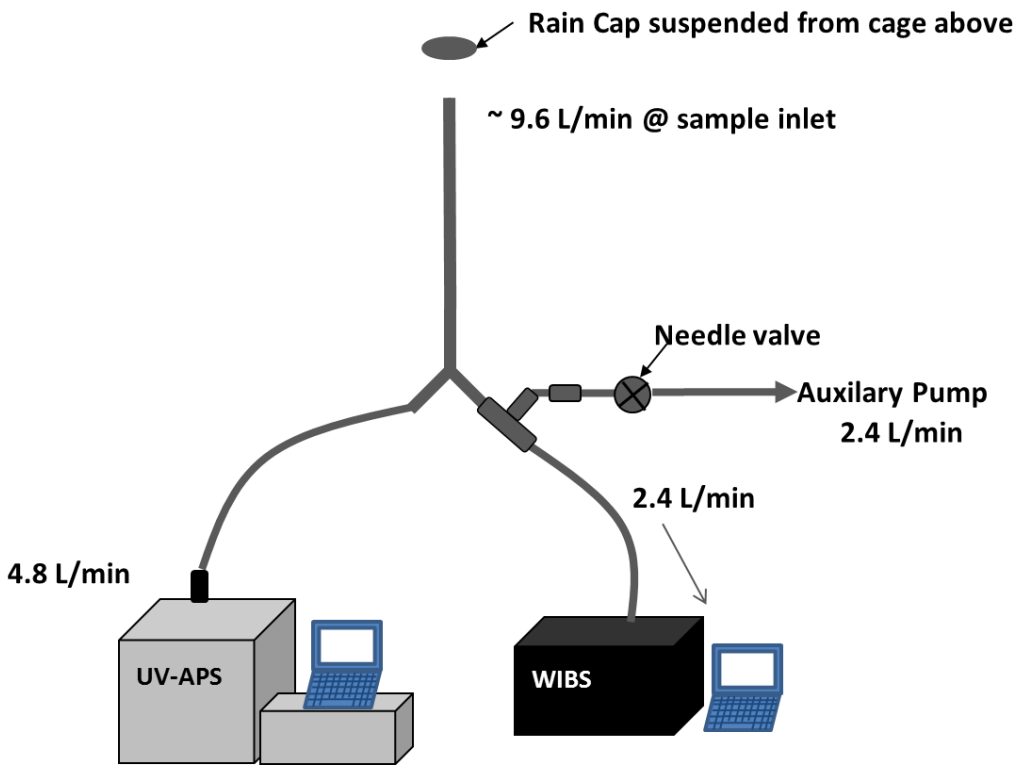

Figure S2. Schematic diagram of sample inlet design, with corresponding flow rates on each line.

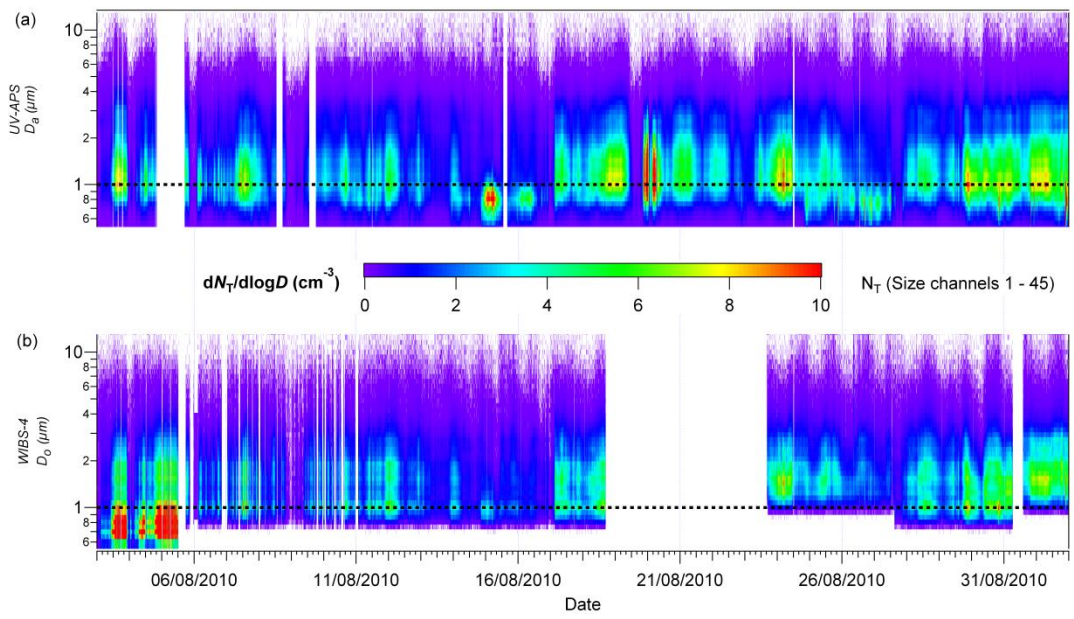

Figure S3. Size-resolved total particle number (N_T) concentrations as measured by: (a) UV-APS and (b) WIBS-4. Colour-scale shows number concentration as $dN_T/dlogD$. UV-APS particle size reported in aerodynamic diameter (D_a) and WIBS-4 particle size reported in optical diameter (D_o). Dashed black line at 1 µm shows the point above which coarse particle number was integrated.

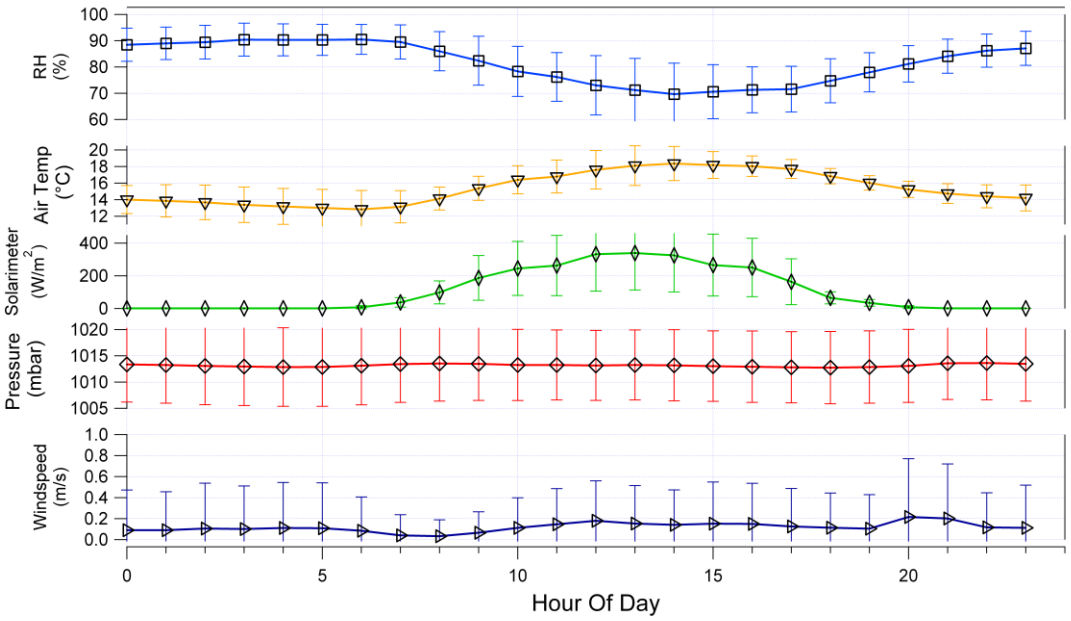

Figure S4. Diurnal trends of meteorological data averaged over entire measurement period. Symbols are mean values and bars are ± 1 standard deviation. Shown are: relative humidity (%), air temperature (^{o}C), down-welling solar radiation (W m^{-2}), atmospheric pressure (mbar), and wind speed (m s^{-1}).