

Development and Application of an Improved Protocol to Characterize Biofilms in Biologically Active Drinking Water Filters

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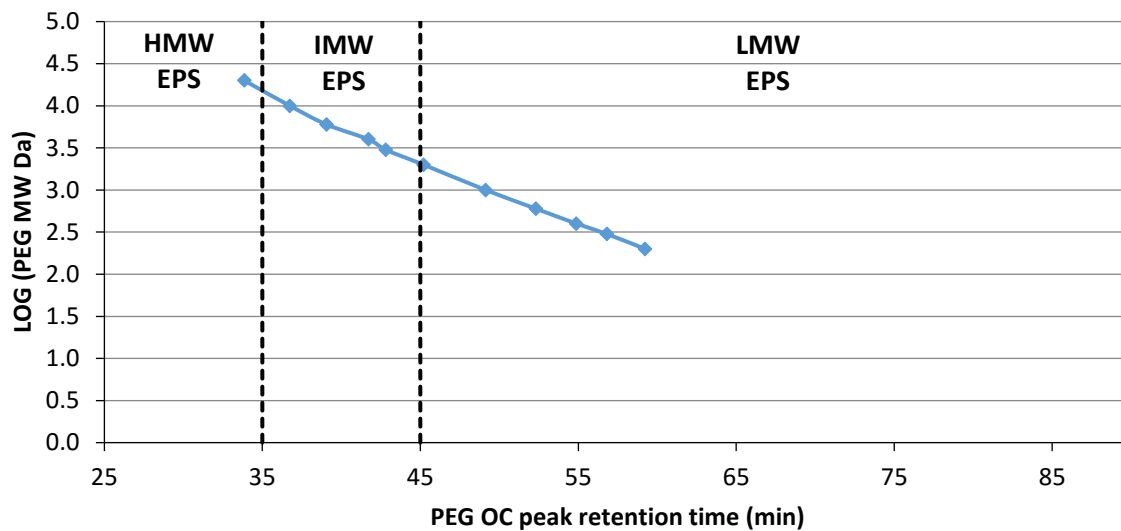


Figure S1. Organic carbon peak retention time for polyethylene glycol (PEG) standard solutions as measured by LC-OCD.

Sampling Date	Biofilter	Sampling depth (cm)	Media Type	Cell Count (cells / cm ³)	ATP (ng ATP / cm ³)	Proteins (µg BSA / cm ³)	Carbohydrates (µg D-Glucose/ cm ³)	Protein Like FEEM response (A.U. / cm ³)	Fulvic acid like FEEM response (A.U. / cm ³)	Humic acid like FEEM response (A.U. / cm ³)	HMW EPS Organic carbon (ng C/ cm ³)	HMW EPS Organic nitrogen (ng N/ cm ³)	HMW EPS UV Absorbance (10 ⁻³ x cm ⁻¹ / cm ³)	IMW EPS Organic carbon (ng C/ cm ³)	IMW EPS Organic nitrogen (ng N/ cm ³)	IMW EPS UV Absorbance (10 ⁻³ x cm ⁻¹ / cm ³)	LMW EPS Organic carbon (ng C/ cm ³)	LMW EPS Organic nitrogen (ng N/ cm ³)	LMW EPS UV Absorbance (10 ⁻³ x cm ⁻¹ / cm ³)
2014-04-11	Biofilter A	10	A	1.1E+08	322	34	17	1912	2432	4010	4194	1067	26	9204	1330	53	14658	4517	10
2014-04-11	Biofilter A	30	S	3.4E+08	490	62	28	4788	1981	3478	10179	2445	57	12357	2563	62	21913	8437	17
2014-04-11	Biofilter B	10	A	1.4E+08	325	35	16	2014	2682	4355	4509	1091	27	9693	1331	56	14783	4685	16
2014-04-11	Biofilter B	20	S	2.5E+08	537	67	40	5297	2120	3858	11654	2642	66	14851	2804	71	26216	8125	33
2014-04-11	Biofilter C	85	S	2.1E+08	378	62	21	4859	1748	3048	10075	2147	56	12167	2227	59	23000	7280	19
2014-05-08	Biofilter A	10	A	1.6E+08	646	62	25	4996	2775	5104	8789	2176	44	15845	2500	85	28473	20229	41
2014-05-08	Biofilter A	30	S	1.6E+08	514	64	27	5999	1905	3573	11137	2645	48	13000	2260	53	24003	17440	17
2014-05-08	Biofilter B	10	A	1.1E+08	701	60	26	5051	3049	5616	8475	2283	45	15041	2448	82	27056	19501	25
2014-05-08	Biofilter B	20	S	2.7E+08	661	111	52	11833	4874	7638	20967	4746	86	27025	4895	129	56924	40910	64
2014-05-08	Biofilter C	85	S	1.2E+08	256	59	29	5654	2553	4280	10025	2226	41	13458	2060	61	25154	21751	41
2014-05-29	Biofilter A	20	A	3.5E+08	1088	66	24	7664	3262	5992	10093	2744	50	16487	2384	77	31705	15745	0
2014-05-29	Biofilter A	20	S	1.2E+09	2158	166	102	24289	5887	12494	33816	8518	139	37949	7105	166	79398	54100	47
2014-05-29	Biofilter B	20	A	3.6E+08	782	63	24	7116	3361	6168	9535	2579	49	15950	2219	76	30318	12976	8
2014-05-29	Biofilter B	20	S	1.0E+09	1954	154	73	20632	5344	11359	31424	7515	125	35659	6246	156	71799	45826	18
2014-05-29	Biofilter C	85	S	1.4E+08	531	55	29	5351	1726	3432	8042	1946	34	11521	1307	47	21864	1952	8
2014-06-19	Biofilter A	85	S	6.4E+08	1332	143	45	19610	3814	9615	29515	6791	102	25313	5616	105	59712	26973	64
2014-06-19	Biofilter A	20	A	2.6E+08	539	61	18	7037	2537	5138	10510	2547	43	13198	2256	63	26719	10988	14
2014-06-19	Biofilter B	20	S	5.8E+08	1048	119	45	15412	3327	8208	24928	5550	83	21701	4481	90	49242	20854	63
2014-06-19	Biofilter B	20	A	1.9E+08	317	47	13	4332	3466	5944	7222	1886	36	11072	1643	61	19081	6639	23
2014-06-19	Biofilter B	60	S	2.3E+08	570	67	24	7837	1851	4148	12484	2903	45	12656	2162	46	26632	10529	33
2014-06-19	Biofilter C	85	S	1.4E+08	376	51	11	5044	1495	3117	9777	2109	33	9759	1563	40	17843	7495	18

Table S1. Biomass and EPS characterization data for 21 biofilter media samples including sand (S) and anthracite (A).

Enzyme Name	UniProtKB ID number	C atoms	N atoms	C/N	MW (KDa)	Aromatic Structure
Protease	L7VS79	2114	568	3.72	48	yes
Peptidase	K2EKF2	1621	435	3.72	36.8	yes
α -Glucosidase	S5ZCH6	2722	741	3.67	60	yes
β -Glucosidase	K4I2K9	3732	1008	3.70	84	yes
β - Xylosidase	C0INJ3	2687	755	3.56	60	yes
β -Glucuronidase	H8ZT98	1233	326	3.78	28	yes
Esterase/lipase protein	M1NXW5	1402	391	3.58	32	yes
Phosphatase	W0FHD8	1323	312	4.24	28	yes
Endocellulase	F8V2V6	1842	495	3.72	40	yes
Alginate lyase	G3LI08	1566	433	3.62	35	yes
Chitinase	Q5UM79	1286	328	3.92	28	yes
Esterase	Q4TZQ3	1684	463	3.64	38	yes
Lipase	Q2KTB3	2865	772	3.71	65	yes

Table S2. Enzymes commonly found in bacterial biofilms¹. Protein information was obtained from the Universal Protein Resource Knowledge Base (UniProtKB) and molecular composition generated using the ProtParam tool from the SIB Bioinformatics Resource Portal².

References

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2. E. Gasteiger, C. Hoogland, A. Gattiker, S. Duvaud, M. R. Wilkins, R. D. Appel and A. Bairoch, in *The Proteomics Protocols Handbook*, ed. J.M. Walker, Humana Press, 2005, pp. 571–607.