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SUPPLEMENTARY MATERIAL TO
**Monte Carlo optimization based QSAR modeling of the cytotoxicity of
acrylic acid-based dental monomers**

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Table S-II. The statistical quality of QSAR models developed with the Monte Carlo optimization method for predicting the cytotoxicity of acrylic acid-based dental monomers

Run	Training set							Test set						
	r ²	CCC	IIC	q ²	RMSE	MAE	F	r ²	CCC	IIC	q ²	RMSE	MAE	F
Split 1	1	0.6442	0.7836	0.5665	0.5936	0.468	49	0.8815	0.9387	0.5747	0.8203	0.206	0.159	59
	2	0.6663	0.7997	0.5762	0.6137	0.453	54	0.8936	0.9282	0.5775	0.8419	0.245	0.190	67
	3	0.6439	0.7834	0.7489	0.5879	0.468	49	0.8815	0.9253	0.6957	0.8285	0.246	0.196	60
Av	0.6515	0.7889	0.6305	0.5984	0.463	51	0.8855	0.9307	0.6160	0.8302	0.232	0.182	62	
Split 2	1	0.8855	0.9393	0.8646	0.8751	0.247	209	0.8069	0.8819	0.8977	0.7072	0.272	0.215	33
	2	0.8686	0.9297	0.8698	0.8554	0.265	178	0.8038	0.8834	0.8964	0.7483	0.278	0.227	33
	3	0.8671	0.9288	0.8691	0.8512	0.267	176	0.8023	0.8806	0.8957	0.7041	0.278	0.230	32
Av	0.8737	0.9326	0.8678	0.8606	0.260	188	0.8043	0.8820	0.8966	0.7199	0.276	0.224	33	
Split 3	1	0.8102	0.8952	0.7314	0.7852	0.301	115	0.8027	0.7968	0.8958	0.6967	0.437	0.374	33
	2	0.7998	0.8888	0.7465	0.7753	0.309	108	0.7880	0.8098	0.8877	0.6682	0.424	0.336	30
	3	0.7985	0.8880	0.7260	0.7685	0.310	107	0.7831	0.7920	0.8847	0.6676	0.426	0.336	29
Av	0.8028	0.8907	0.7346	0.7763	0.301	110	0.7913	0.7995	0.8894	0.6775	0.429	0.349	31	

r² – Correlation coefficient; CCC – Concordance correlation coefficient IIC – Index of ideality of correlation q² – Cross-validated correlation coefficient
 RMSE – Root-mean-square deviation; MAE – Mean absolute error F – Fischer ratio; Av – Average value for statistical parameters obtained from three independent Monte Carlo optimization runs

Table S-III. Y-randomization of the best QSAR model (best optimization run) for three independent splits

Run	Split 1		Split 2		Split 3	
	Training	Test	Training	Test	Training	Test
0	0.7779	0.9025	0.9222	0.8107	0.8481	0.856
1	0.0004	0.1169	0.0824	0.0308	0	0.1555
2	0.0002	0.0035	0.021	0.0536	0.0401	0.0423
3	0.0005	0.3662	0.0008	0.0552	0.0113	0.0533
4	0.014	0.1484	0.0412	0.177	0.0079	0.0129
5	0.0001	0.0024	0.0376	0.1078	0.0511	0.0294
6	0.0279	0.0496	0.0001	0.0006	0.0581	0.008
7	0	0.0748	0.0376	0.0631	0.0018	0.0511
8	0.0162	0.1267	0.2047	0.0599	0.033	0.0068
9	0.0367	0.2484	0.0032	0.3614	0.0026	0.2574
10	0.0159	0.2321	0.0114	0.0379	0.009	0.0733
R^2	0.0112	0.1369	0.044	0.0947	0.0215	0.069
${}^cR_p^2$	0.7723	0.8312	0.9	0.7619	0.8373	0.8208

^c $R_p^2 = R \times (R^2 - R_C^2)^{1/2}$ should be > 0.5

Table S-IV. The list of SAKs together with their correlation weights for the three runs of the Monte Carlo optimization obtained from QSAR model for cytotoxicity of acrylic acid-based dental monomers

SA _k (CW)	CW			SA _k (CW)	CW			SA _k (CW)	CW			SA _k (CW)	CW		
	Run 1	Run 2	Run 3		Run 1	Run 2	Run 3		Run 1	Run 2	Run 3		Run 1	Run 2	Run 3
10001000000	2.04072	1.64329	2.17548	EC0-C...2...	-0.57805	2.13528	0.26973	P4E0C...0...	0.19057	-0.42875	-0.64271	S2E00...6...	2.64238	1.68778	-0.65004
10011000000	-0.68648	-0.89667	-1.64588	EC0-C...3...	0.60777	-0.64754	0.09522	P4E0C...1...	1.15094	0.14607	0.35132	S2E00...7...	2.59459	-1.3961	0.82873
(...C...C...)	1.86481	2.36047	1.83992	EC0-C...4...	-1.08495	2.88662	4.42322	P4E0C...10...	-0.30488	-0.88076	2.07319	S3E0C...0...	2.6031	2.80396	3.19456
(...C...C...)	2.38315	0.01164	0.48356	EC0-N...2...	0.71245	1.41515	-0.46103	P4E0C...11...	0.78769	0.2757	0.1774	S3E0C...1...	3.26508	1.7543	2.38114
(...C...C...)	0.59231	0.23821	0.75957	EC0-N...3...	-0.05248	-0.67878	-0.79341	P4E0C...12...	2.09153	-0.41509	-0.75097	S3E0C...10...	1.41755	-0.98002	1.14167
(...O...C...)	-1.76475	-0.02351	3.13201	EC0-O...1...	-0.73709	2.01317	-0.78123	P4E0C...2...	1.45036	1.456	-0.17449	S3E0C...11...	-1.11642	1.76198	0.61019
+++N---B2	-0.66841	-0.9578	-0.02689	EC0-O...2...	0.43285	-0.67693	-0.95118	P4E0C...3...	-0.93113	-0.42538	0.24947	S3E0C...2...	0.02929	-0.50083	0.31047
+++N---O	-0.0466	-0.51999	-0.59267	Cmax.0.....	0.07451	-0.90299	-0.78808	P4E0C...4...	0.08828	0.17332	0.85628	S3E0C...3...	0.63614	2.14929	-0.42529
+++O---B2	2.93892	2.29353	4.26808	Cmax.1.....	0.62707	-0.98917	-0.35355	P4E0C...6...	-0.90566	-0.64323	-0.86677	S3E0C...4...	-0.86744	2.18077	0.12449
1...C.....	-0.55378	-1.23046	-0.99908	Cmax.2.....	2.15876	2.21378	1.33399	P4E0C...7...	-0.20717	0.38263	-0.73385	S3E0C...5...	-0.57557	1.25306	2.41236
1.....	1.72756	3.4168	1.46401	HALO00000000	3.10012	5.12254	0.67608	P4E0C...9...	1.99289	0.80198	3.80959	S3E0C...6...	1.32358	-1.46925	-1.79261
1.e...C...	2.01002	-0.86826	-0.95821	N...C.....	-1.54125	-0.74101	-0.71144	P4E0N...0...	1.63655	2.41321	-0.63807	S3E0C...7...	-0.86923	3.47435	-0.01045
2.....	-0.69637	2.4027	-0.58136	N...C...C...	-1.47049	-0.96695	-0.76188	P4E0N...2...	-0.52122	1.13736	-0.98008	S3E0C...8...	0.09488	3.10096	-1.50905
2.e...C...	0.47004	1.4202	-0.47823	N.....	-1.12924	-1.38708	-0.81376	P4E0O...0...	-0.30012	0.0685	-0.65479	S3E0C...9...	-0.48167	-1.05033	-0.85821
=...C.....	-0.73963	-1.82271	-0.56441	N...C...C...	2.89675	-0.07344	-0.63735	P4E0O...1...	3.0397	1.28555	2.0656	S3E0N...1...	-0.67174	-1.14393	-0.65369
=.....	-0.0911	-0.84168	0.02385	N...C.....	-0.66218	-1.12418	-1.09708	P4E0O...11...	-0.55104	1.60997	-0.09848	S3E0N...2...	0.32892	-1.68074	0.33572
=...2.....	-0.07831	-0.53642	0.64225	N...C...C...	0.35577	1.32927	0.17781	P4E0O...2...	-4.96228	-5.71882	-2.52658	S3E0N...3...	-1.91307	1.03169	1.05043
=...C...C...	2.12334	-0.15232	1.48761	O...C...C...	-1.60948	-0.33487	-1.10797	P4E0O...3...	-0.50319	0.47694	-0.31965	S3E0O...0...	2.70025	-0.53862	-0.69574
=...O...C...	-0.47436	-0.7329	0.07426	O...C.....	-0.67315	-0.21132	-0.69041	P4E0O...4...	-0.63363	-0.88632	-1.97634	S3E0O...1...	0.27918	2.34591	0.23796
C...C...C...	-4.48737	-2.88755	-1.87188	O...C...C...	-1.55361	2.71448	3.41292	P4E0O...6...	0.84905	2.26782	1.14724	S3E0O...2...	0.55713	-0.98591	-0.81886
C...C.....	0.85977	0.7236	0.43071	O...C...C...	2.11584	4.06705	2.38901	P4E0O...8...	2.70512	0.55054	-0.38219	S3E0O...3...	-1.37363	-1.83098	0.23636
C...C...1...	-0.43911	-1.79311	-0.79008	O...C...O...	-2.33768	-1.1146	-0.78522	NNEOC...100-	-0.49194	-1.60235	-0.5722	S3E0O...4...	4.46801	4.21327	2.10524
C...C...C...	-0.91602	-0.83295	-0.25098	O.....	-0.53045	-0.64042	-0.79137	NNEOC...109-	0.23401	2.63775	2.20755	S3E0O...5...	-1.4588	0.24585	0.0096
C...C...C...	-1.41874	-0.16738	-0.75001	O...1.....	2.28796	4.46072	-0.75215	NNEOC...209-	0.12554	0.46501	0.33865	S3E0O...7...	2.32898	-0.69626	2.68917
C.....	-0.85829	-0.91601	-0.30648	O...=...C...	-0.55988	-1.18035	-0.17877	NNEOC...218-	1.18373	-0.25966	-1.31109	S3E0O...8...	0.51323	-0.7615	2.23785
C...1.....	2.36179	1.07117	2.38854	O...=.....	-0.96694	-0.80896	-0.23906	NNEOC...300-	1.71752	1.90165	2.03515	Nmax.0.....	1.8318	1.89273	-0.1544
C...1...C...	2.03818	2.30487	0.44927	O...=...2...	4.11841	2.14122	-0.83664	NNEOC...309-	-1.12492	-0.98457	-0.38732	Nmax.1.....	-0.27836	-0.67618	-0.66019
C...2.....	-0.11522	4.24878	0.45511	O...=...C...	2.40021	0.9572	2.39268	NNEOC...318-	-0.73448	-1.45937	0.39744	Nmax.2.....	-1.79641	1.64042	-1.95179

SA _k (CW)	CW			SA _k (CW)	CW			SA _k (CW)	CW			SA _k (CW)	CW		
	Run 1	Run 2	Run 3		Run 1	Run 2	Run 3		Run 1	Run 2	Run 3		Run 1	Run 2	Run 3
	C...2...=...	1.27096	-0.6899		0.82935	O...C...(...	1.09343		1.18595	-0.74038	NNEOC...327-		0.2283	0.95106	-0.58411
C...=...C...	-0.95726	-0.11894	-0.48055	O...C.....	0.92199	0.50283	0.05931	NNEOC...427-	2.96874	-0.50624	-0.17058	Omax.2.....	-1.51955	-1.87402	-1.92046
C...=.....	4.22321	1.85861	2.46372	O...C...1...	3.25323	3.99833	4.43099	NNEOC...436-	-2.10898	0.76726	1.8355	Omax.3.....	4.26554	2.09267	2.37161
C...=...C...	2.8012	3.20602	1.43809	O...C...2...	-1.11112	0.87075	1.79825	NNEON...218-	-1.15669	-1.42372	-0.98128	Omax.4.....	0.72815	4.33725	-1.10246
C...C...(...	1.33519	0.6716	0.91631	O...C...C...	0.31427	0.27734	0.32731	NNEON...327-	0.41046	-0.85664	-0.70549	Omax.6.....	2.46839	2.34804	2.34852
C...C.....	1.22831	0.44223	2.02694	O...e...1...	4.08137	-1.50835	0.20516	NNEO...109-	-0.20716	1.50682	2.11827	Omax.7.....	2.66992	2.6593	2.31455
C...C...1...	-1.92915	1.26609	-1.55957	P2EOC...0...	0.24879	0.46539	0.2662	NNEO...218-	0.58391	0.00576	-0.91952	Omax.8.....	-0.85145	1.52513	-0.63281
C...C...=...	0.76893	0.77539	0.81123	P2EOC...1...	0.4909	-0.23989	0.30203	NOSP01000000	1.99412	1.31782	2.3857	Smax.0.....	2.35774	4.91929	1.30404
C...C...C...	0.82138	0.9339	0.92997	P2EOC...2...	0.69635	-1.18758	0.05557	NOSP10000000	-0.38648	-0.62676	-0.51823	e...(...)	-1.1569	-0.55175	-0.60163
C...N...(...	-1.03468	-0.9504	-0.73638	P2EON...1...	-0.00182	3.08929	1.52438	S2EOC...0...	0.52342	0.00279	1.01559	e...(...C...	-0.77989	-0.45582	-0.09065
C...N...C...	1.91526	1.30654	1.68492	P2EON...2...	-1.82858	1.14379	2.27136	S2EOC...1...	0.25801	1.20806	0.81339	e...(...O...	2.23292	-0.89815	-0.58278
C...O...(...	-0.85745	-1.81488	-0.68961	P2EO...0...	0.47633	-0.73191	1.03036	S2EOC...2...	0.04606	0.00094	0.20543	e...(...e...	-1.12445	3.08107	1.33856
C...O...1...	-1.0489	1.51674	2.21203	P2EO...1...	-0.36896	-0.74227	0.00983	S2EOC...3...	-0.52242	-0.0755	-0.65247	e.....	0.13081	1.0173	0.06026
C...O...C...	-0.65933	0.6882	-0.72869	P2EO...2...	-0.97739	-0.65778	-0.59931	S2EOC...4...	0.74275	-2.71042	-0.52924	e...1...(...	-0.55346	-0.71309	-1.28325
C...e...1...	0.34836	-1.96338	2.04929	P2EO...3...	-1.65077	-1.82568	-1.67783	S2EOC...5...	2.17321	-0.2486	0.30416	e...1.....	-0.47171	-0.95229	1.79985
C3.....0...	-0.72705	-1.88642	-0.59877	P3EOC...0...	-0.07245	0.22551	-0.20371	S2EOC...6...	-0.89218	-1.31795	0.42055	e...1...e...	1.32654	1.66162	0.07356
C3...H.1...	2.99293	2.31551	2.51151	P3EOC...1...	1.06332	1.94457	-0.66478	S2EOC...7...	-0.68778	0.39354	2.26095	e...2.....	-0.77289	4.49669	2.04503
C4.....0...	0.67212	-1.22272	2.18393	P3EOC...2...	1.44811	0.01957	0.46843	S2EOC...8...	2.30477	4.43347	-1.74675	e...2...e...	0.60447	3.31636	-0.54616
C5.....0...	4.3235	4.16548	4.3648	P3EOC...3...	-1.5109	-1.56784	-1.43801	S2EOC...9...	-0.74215	-0.64691	0.90498	e...C.....	1.89214	0.8456	1.92529
C5...H.1...	-1.78297	-4.67514	-1.47067	P3EOC...4...	0.49952	0.42785	-0.53465	S2EON...1...	-1.03619	-0.66219	-0.68997	e...C...O...	2.35666	1.88731	0.22163
C5...AH.1...	1.35155	-0.46432	-0.52543	P3EOC...5...	2.3124	3.31191	0.02562	S2EON...3...	-0.66226	2.2539	1.04249	e...O.....	0.53269	0.01469	2.60098
C6.....0...	2.27699	1.28413	-0.68345	P3EON...0...	1.12737	-1.34512	2.37152	S2EO...0...	-0.01955	-0.84339	1.13238	e...O...C...	1.50841	-2.82109	-1.96518
C6...A.1...	0.78966	-0.22067	1.00799	P3EON...2...	-0.95411	-0.74931	-0.96078	S2EO...1...	2.26042	4.4307	2.44092	e...e...(...	-0.42576	0.9723	-0.59307
C6...A.2...	3.48234	0.93083	-1.05247	P3EO...0...	0.64866	-0.92118	0.26571	S2EO...2...	0.19888	0.74327	-0.03641	e...e.....	2.06053	0.31807	1.86427
C7.....0...	0.69561	4.4304	2.06093	P3EO...1...	2.01562	-0.73381	0.74247	S2EO...3...	2.25665	3.43735	1.17877	e...e...1...	-0.83299	-0.7083	-0.116
BOND10000000	1.41096	0.83037	0.01221	P3EO...2...	-0.63439	-1.50608	0.57711	S2EO...4...	-0.52118	0.29808	-0.89888	e...e...2...	-0.42429	2.28212	0.83626
EC0-C...1...	-0.60445	-1.14516	-0.42115	P3EO...3...	-1.90308	0.5397	0.75782	S2EO...5...	2.41122	2.44651	2.32521	e...e...e...	-0.05854	2.36627	0.60061