Skin damages: Structure Activity Relationship of benzimidazole derivatives bearing a 5-membered ring system

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Table S1. The three classes of benzimidazole derivatives.

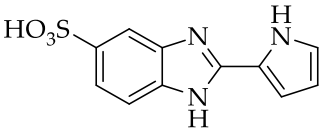
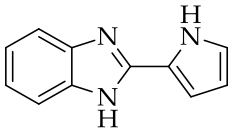
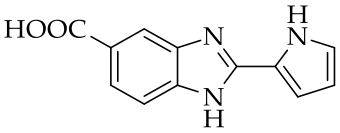
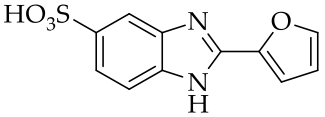
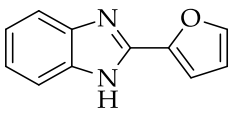
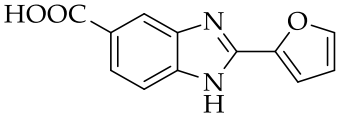
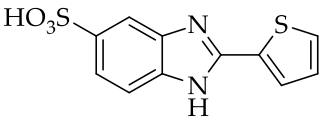
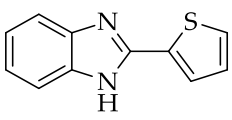
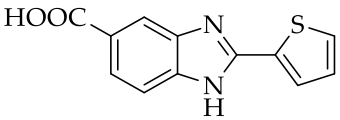
Class A	 **7**	 **10**	 **13**
Class B	 **8**	 **11**	 **14**
Class C	 **9**	 **12**	 **15**

Table S2. UV filtering activity of benzimidazole derivatives **7-15** in solution.

Compound	SPF	UVAPF	UVA/UVB	λc (nm)
PBSA	3.40±0.17	1.03±0.08	0.29	322
7	5.43±0.39	1.22±0.03	0.2	345
10	13.13±0.70	1.16±0.05	0.02	325
13	7.40±0.23	1.10±0.09	0.7	345
8	10.96±0.54	1.33±0.05	0.29	342
11	20.06±3.04	1.05±0.06	0.3	333
14	16.66±1.21	1.20±0.10	0.5	332
9	4.72±0.17	1.43±0.09	0.48	339
12	7.03±0.42	1.49±0.07	0.37	345
15	6.40±0.12	1.42±0.11	0.43	342

Table S3. Percent growth inhibition of dermatophytes treated with benzimidazole derivatives at 100 μg/mL. Each value is the mean of three measurements.

	Percent growth inhibition				
Compound (100 μg/mL)	***M. gypseum***	***M. canis***	***T. mentagrophytes***	***T. tonsurans***	***E. floccosum***
PBSA	9.62 ± 0.61	+	+	+	7.41 ± 0.43
7	73.04 ± 3.67	72.11 ± 7.51	69.03 ± 1.84	56.58 ± 4.04	52.46 ± 6.58
10	99.07 ± 1.33	96.85 ± 3.56	96.26 ± 2.42	96.97 ± 0.62	101.75 ± 4.92
13	3.74 ± 1.49	8.66 ± 1.78	+	4.55 ± 1.34	21.05 ± 2.14
8	8.00 ± 2.44	+	+	+	+
11	99.00 ± 0.28	98.32 ± 2.03	97.22 ± 4.53	94.74 ± 5.63	97.87 ± 4.23
14	+	18.72 ± 0.59	+	+	6.45 ± 1.47
9	59.80 ± 6.12	65.91 ± 3.21	57.27 ± 1.09	50.75 ± 2.11	50.00 ± 3.26
12	100.00 ± 1.63	92.91 ± 1.33	98.13 ± 2.76	96.97 ± 1.34	94.74 ± 5.45
15	2.14 ± 0.59	20.30 ± 0.54	+	4.48 ± 0.90	6.45 ± 2.98

Table S4. Cytotoxicity and antiviral activity of compounds in human embryonic lung (HEL) cell cultures.

		Antiviral EC_{50}[b] (μM)					
Compound	**Cytotoxic concentration[a] (μM)**	**Herpes simplex virus-1 (KOS)**	**Herpes simplex virus-2**	**Herpes simplex virus-1 TK-KOS ACVr**	**Vaccinia virus**	**Adeno virus-2**	**Human Coronavirus (229E)**
7	>100	>100	>100	>100	>100	>100	>100
10	>100	>100	>100	>100	>100	>100	>100
13	>100	>100	>100	>100	>100	>100	>100
8	>100	>100	>100	>100	>100	>100	>100
11	>100	>100	>100	>100	>100	>100	>100
14	>100	>100	>100	>100	>100	>100	>100
9	>100	>100	>100	>100	>100	>100	>100
12	>100	>100	>100	>100	>100	>100	>100
15	>100	>100	>100	>100	>100	>100	>100
Birivudin	>250	0.01	250	0.1	5.8	-	-
Cidofovir	>250	4.5	3.4	2.8	50	10	-
Acyclovir	>250	0.6	0.6	2	>250	-	-
Ganciclovir	>250	0.01	0.01	0.2	>100	-	-

[a] Cytotoxic concentration, as determined by measuring the cell viability with the colorimetric formazan-based MTS assay. [b]concentration producing 50% inhibition of virus-induced cytopathic effect, as determined by MTS method. – not detected.

Table S5. Cytotoxicity and antiviral activity of compounds in HeLa cell cultures.

Compound	Cytotoxic concentration[a] (μM)	Antiviral EC_{50}[b] (μM)		
		Vesicular stomatitis virus	Coxsackie virus B4	Respiratory syncytial virus
7	>100	>100	>100	>100
10	>100	>100	>100	>100
13	>100	>100	>100	>100
8	>100	>100	>100	>100
11	>100	>100	>100	>100
14	>100	>100	>100	>100
9	>100	>100	>100	>100
12	>100	>100	>100	>100
15	>100	>100	>100	>100
DS-10.000	>100	>100	>100	0.8
Ribaravin	>250	112	250	10

[a] Cytotoxic concentration, as determined by measuring the cell viability with the colorimetric formazan-based MTS assay. [b]concentration producing 50% inhibition of virus-induced cytopathic effect, as determined by MTS method.

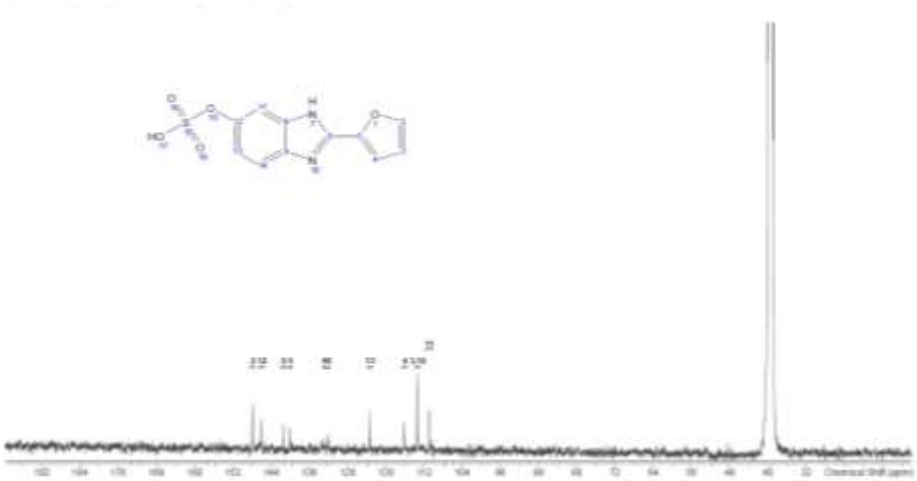


Figure S1. Representative ^{13}C-NMR spectrum of newly synthesized compound **8**.

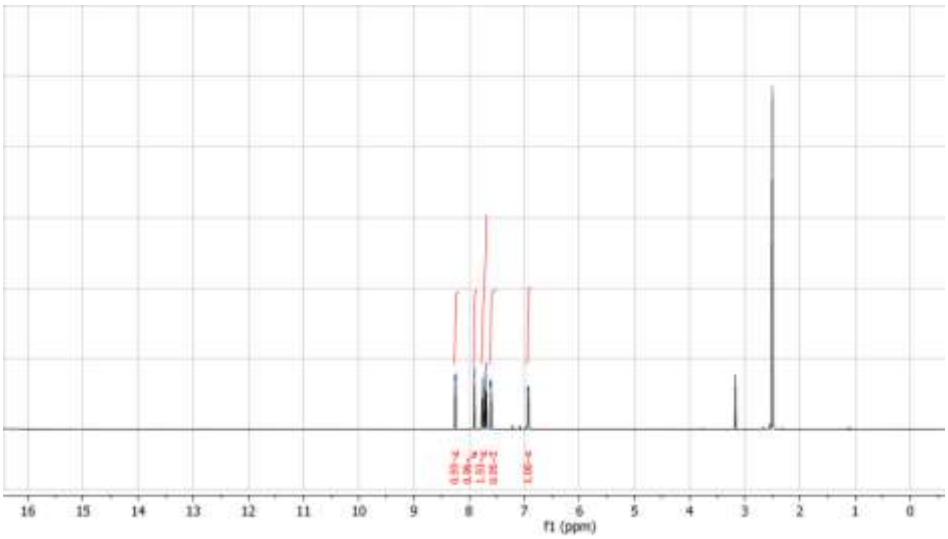


Figure S2. Representative ^{1}H-NMR spectrum of newly synthesized compound **8**.

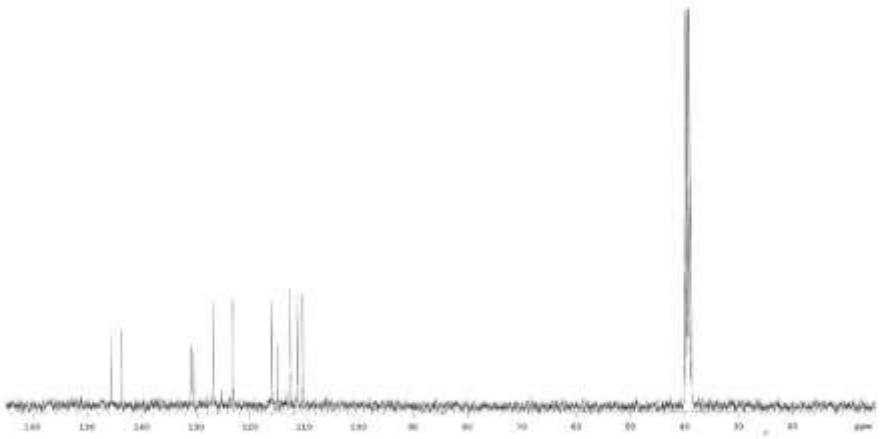


Figure S3. Representative ^{13}C-NMR spectrum of newly synthesized compound **7**.

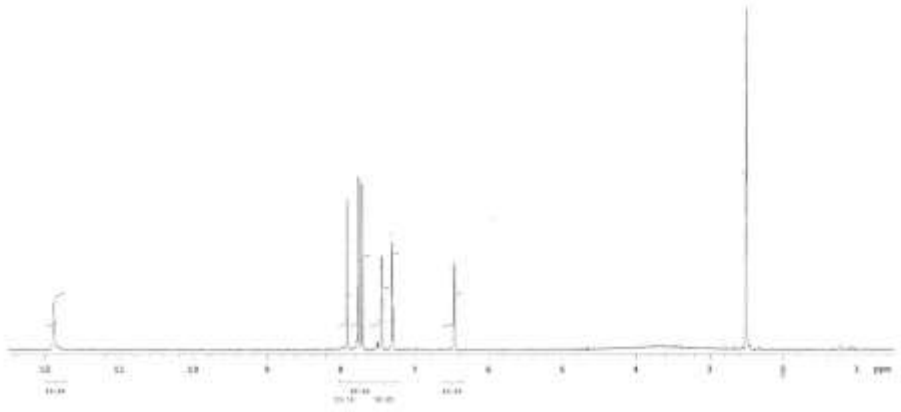


Figure S42. Representative ^{1}H-NMR spectrum of newly synthesized compound **7**.

Following the general procedure benzimidazoles **9** [CAS number 1158706-59-2], **10** [1S], **11** [1S], **12** [2S, 3S], **13** [**CAS Registry Number** 1030658-13-9], **14** [4S], and **15** [**CAS Registry Number** 1158380-17-6, 5S] were prepared and their analytical and spectral data are in agreement with those reported in literature or those reported as commercial sources.

References:

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