Supplemental Table 1. List of representative differentially expressed genes and their FPKM values in melanocyte and keratinocyte from three different individuals

Gene	MEL0	MEL1	MEL2	NHK0	NHK1	NHK2
KRT5 (Keratin 5, Type II)	0	0	0	8747.22	11063.6	9280.07
KRT14 (Keratin 14, Type I)	0	0	0	5935.6	6560.25	6846.42
KRT17 (Keratin 17, Type I)	0.067	0.081	0	1907.64	4594.78	5690.6
KRT6A (Keratin 6A, Type II)	0	0	0	1691.96	2810.26	3101.04
SFN (Stratifin)	0	0.045	0.131	1794.51	2027.98	2036.84
FGFBP1 (FGF Binding Protein 1)	0	0	0	2417.07	2316.18	1902.18
LAMC2 (Laminin Subunit Gamma-2)	0	0.046	0.122	1586.44	1079.68	1623.43
LGALS7B (Galectin-7B)	0	0	0	321.346	644.36	1535.07
S100A9 (S100 Calcium-binding Protein A9)	0	0	0	20.1211	875.886	1344.96
S100A14 (S100 Calcium-binding Protein A14)	0.11	0	0.087	1310.28	1312.22	1325.55
LGALS7 (Galectin-7)	0	0	0	200.039	648.022	1318.26
S100A8 (S100 Calcium-binding Protein A8)	0	0	0	3.9958	472.497	1062.23
KRT16 (Keratin 16, Type I)	0	0	0	261.095	523.035	804.666
SPRR1B (Small Proline-Rich Protein 1B)	0	0	0	139.581	713.213	794.896
COL17A1 (Type XVII Collagen Alpha-1)	0	0	0	517.048	714.398	681.263

Gene	MEL0	MEL1	MEL2	NHK0	NHK1	NHK2
PMEL (Premelanosome Protein)	11129.9	7590.49	7561.95	0.278543	0.660627	0.606171
TYRP1 (Tyrosinase-Related Protein 1)	7714.41	3934.75	5800.6	0.013391	0	0.066389
MLANA (Melan-A)	3004.16	3136.04	1181.89	0.217386	0.210209	0.033679
TYR (Tyrosinase)	1108.37	1722.8	1734.39	0	0	0
A2M (Alpha-2-Macroglobulin)	820.086	945.033	1410.8	0.008035	9.83E-09	0.059752
SPP1 (Secreted Phosphoprotein 1)	776.796	587.117	290.461	0	0	0.165868
GMPR (Guanosine Monophosphate Reductase)	501.417	220.03	275.655	0.109443	0.151185	0.712135
TSPAN10 (Tetraspanin 10)	471.877	148.227	74.1744	0.177637	0.504801	1.63552
GPR143 (G Protein-Coupled Receptor 143)	456.944	302.492	265.059	0.168192	0.265533	1.25075
CYP27A1 (Cytochrome P450 Family 27 Subfamily A Member 1)	412.853	161.323	115.655	0.856995	0.227301	0.870979
DCT (Dopachrome Tautomerase)	404.191	8.91536	62.4922	0	0	0
GYPC (Glycophorin C)	389.539	280.499	289.345	0	0.049086	0.110101
OCA2 (Oculocutaneous Albinism II)	374.745	301.773	331.867	0.012185	0	0.030203
SOX10 (Sex Determining Region Y-box 10)	359.372	273.329	273.06	0	0.014877	0
PLP1 (Proteolipid Protein 1)	358.99	175.59	211.511	0	0.029106	0

Supplemental Table 2. UVR-induced consistent changes in CDKN1A and GDF15 expression (FPKM values) under different UVB conditions in keratinocytes (NHK) and melanocyte (MEL).

		4h		24h		72h	
	Gene	**Log FC**	**p-value**	**Log FC**	**p-value**	**Log FC**	**p-value**
NHK	CDKN1A	1.498	0.038	2.857	0.008	1.975	0.007
	GDF15	5.006	0.005	5.715	0.007	3.737	0.029
MEL	CDKN1A	1.976	3.62E-06	2.43	1.82E-05	2.043	0.001
	GDF15	1.935	0.007	3.553	1.0E-06	3.19	1.0E-06

Supplemental Table 3. List of common UVB-responsive genes in melanocyte and keratinocyte lines 24h post 30 mJ/cm^2 of UVR.

Gene symbol	Entrez ID	M3		M2		NHK2		MHK1		NHK3	
		LogFC	p-value	LogFC	p-value	LogFC	p-value	LogFC	p-value	LogFC	p-value
GDF15	9518	↑4.957	9.270e-6	↑3.553	1.000e-6	↑5.076	1.000e-6	↑6.989	4.050e-5	↑5.715	0.007
TNFRSF10C	8794	↑4.447	0.003	↑4.173	0.001	↑4.770	1.110e-4	↑4.813	3.075e-4	↑4.846	0.011
FDXR	2232	↑3.432	0.001	↑3.006	1.000e-6	↑1.960	0.014	↑2.125	0.006	↑2.433	0.008
TNFRSF10D	8793	↑3.137	0.003	↑2.103	2.734e-4	↑3.812	2.310e-6	↑3.724	1.590e-6	↑3.026	5.664e-4
MDM2	4193	↑3.105	0.004	↑2.266	3.320e-6	↑2.450	0.002	↑3.682	5.280e-6	↑3.215	6.272e-4
NR4A1	3164	↑3.037	0.003	↑1.520	0.002	↑4.301	0.002	↑3.461	0.003	↑3.727	0.008
CDKN1A	1026	↑3.022	0.009	↑2.430	1.820e-5	↑2.105	0.020	↑3.075	2.997e-4	↑2.857	0.008
HIST2H2BE	8349	↑2.729	0.032	↑2.112	0.008	↑3.635	9.670e-6	↑5.051	1.000e-6	↑3.784	0.004
TRIAP1	51499	↑2.650	0.011	↑1.740	0.002	↑1.590	0.037	↑2.341	0.002	↑2.041	0.017
SERTAD1	29950	↑2.571	0.014	↑1.548	0.025	↑1.886	0.017	↑2.299	0.004	↑2.386	0.012
TNFAIP3	7128	↑2.336	0.036	↑1.324	0.014	↑1.544	0.037	↑1.467	0.044	↑2.130	0.013
TBCD	6904	↓-2.019	0.043	↓-1.221	0.017	↓-1.657	0.031	↓-1.876	0.014	↓-1.825	0.030
MYH10	4628	↓-2.222	0.029	↓-1.434	0.007	↓-1.966	0.011	↓-1.826	0.014	↓-2.094	0.013
NNT	23530	↓-2.285	0.029	↓-1.383	0.009	↓-1.789	0.042	↓-2.213	0.008	↓-2.709	0.008
ANTXR1	84168	↓-2.552	0.037	↓-1.491	0.016	↓-2.137	0.009	↓-1.796	0.023	↓-2.753	0.003
LRBA	987	↓-2.572	0.040	↓-4.096	1.000e-6	↓-2.907	5.019e-4	↓-2.899	2.500e-4	↓-4.165	1.580e-5
SUCLG2	8801	↓-2.615	0.015	↓-1.394	0.006	↓-2.516	0.005	↓-2.160	0.011	↓-3.678	4.741e-4
MYO1D	4642	↓-2.702	0.010	↓-1.281	0.007	↓-1.621	0.032	↓-1.745	0.021	↓-2.783	0.001
DIS3L2	129563	↓-2.818	0.026	↓-2.088	0.003	↓-2.404	0.026	↓-2.428	0.017	↓-2.614	0.035
AP3B1	8546	↓-2.831	0.015	↓-1.851	0.003	↓-1.687	0.034	↓-1.517	0.050	↓-2.742	0.002
ROBO1	6091	↓-2.861	0.028	↓-2.563	0.002	↓-3.069	9.994e-4	↓-2.622	0.004	↓-4.349	1.221e-4
KIF4A	24137	↓-2.900	0.036	↓-2.371	0.016	↓-4.327	7.890e-5	↓-1.914	0.027	↓-2.103	0.031
SERGEF	26297	↓-2.926	0.040	↓-2.683	0.016	↓-3.025	0.023	↓-2.937	0.021	↓-3.563	0.024
FARP1	10160	↓-2.974	0.004	↓-1.524	0.004	↓-2.727	0.004	↓-2.205	0.020	↓-3.446	0.003
SND1	27044	↓-2.981	0.003	↓-2.186	6.220e-6	↓-2.052	0.006	↓-1.650	0.022	↓-2.948	6.291e-4
UTRN	7402	↓-2.986	0.016	↓-3.327	1.360e-5	↓-2.899	0.002	↓-1.988	0.019	↓-4.241	1.621e-4
RSU1	6251	↓-3.064	0.003	↓-2.112	7.500e-5	↓-2.010	0.012	↓-2.053	0.010	↓-3.318	4.267e-4
FBXL7	23194	↓-3.066	0.008	↓-1.365	0.045	↓-6.276	6.537e-4	↓-3.774	0.034	↓-6.209	0.004
ERC1	23085	↓-3.117	0.012	↓-2.125	0.001	↓-1.934	0.018	↓-2.114	0.007	↓-2.650	0.004
VPS13B	157680	↓-3.155	0.032	↓-3.633	5.094e-4	↓-2.509	0.012	↓-2.832	0.003	↓-2.771	0.023
DTD1	92675	↓-3.165	0.010	↓-1.853	0.005	↓-2.103	0.017	↓-2.221	0.008	↓-3.133	8.075e-4
ACACA	31	↓-3.191	0.003	↓-1.920	0.003	↓-2.026	0.007	↓-1.899	0.009	↓-2.720	0.001
DOCK1	1793	↓-3.193	0.017	↓-2.887	3.813e-4	↓-2.194	0.012	↓-2.279	0.005	↓-3.500	6.121e-4
PHKB	5257	↓-3.203	0.020	↓-1.769	0.028	↓-2.179	0.010	↓-1.610	0.047	↓-2.996	0.002
FKBP5	2289	↓-3.253	0.001	↓-1.514	0.002	↓-2.847	2.453e-4	↓-1.782	0.014	↓-2.738	0.001
SCMH1	22955	↓-3.268	0.014	↓-1.836	0.029	↓-2.781	0.009	↓-2.335	0.017	↓-3.408	0.005
ITPR2	3709	↓-3.270	0.034	↓-4.284	7.093e-4	↓-3.394	9.708e-4	↓-2.343	0.014	↓-3.766	0.002
WDR7	23335	↓-3.279	0.015	↓-2.424	0.006	↓-2.556	0.031	↓-2.861	0.007	↓-3.262	0.021
KLF12	11278	↓-3.342	0.027	↓-3.068	0.005	↓-3.357	0.010	↓-2.601	0.045	↓-5.110	0.003

NBAS	51594	-3.401	0.004	-2.575	1.319e-4	-3.171	8.759e-4	-2.292	0.008	-4.099	1.596e-4
PDSS2	57107	-3.418	0.021	-2.409	0.006	-2.752	0.024	-2.340	0.035	-3.648	0.011
EPB41L2	2037	-3.426	0.024	-2.405	0.005	-2.051	0.017	-2.387	0.005	-3.636	2.486e-4
ANO10	55129	-3.442	0.002	-2.205	2.918e-4	-1.956	0.037	-1.859	0.039	-3.287	0.002
SCFD2	152579	-3.476	0.016	-4.136	1.260e-5	-4.577	4.916e-4	-3.109	0.003	-4.297	0.001
DNAJC1	64215	-3.496	0.008	-2.765	0.002	-2.500	0.015	-2.320	0.025	-3.124	0.013
APBB2	323	-3.539	0.017	-2.486	0.007	-2.424	0.004	-1.679	0.034	-2.874	0.003
SBF2	81846	-3.562	0.017	-2.732	0.004	-3.082	0.002	-1.822	0.040	-3.775	0.001
HLCS	3141	-3.618	0.010	-2.374	0.005	-2.286	0.040	-2.370	0.011	-3.286	0.006
GBE1	2632	-3.648	0.008	-2.759	1.490e-5	-2.103	0.029	-1.997	0.027	-3.485	0.003
PARD3	56288	-3.660	0.011	-3.629	4.015e-4	-2.541	0.004	-2.136	0.010	-3.402	5.969e-4
C11orf49	79096	-3.720	0.003	-2.098	0.005	-2.568	0.017	-2.390	0.019	-2.939	0.023
DYM	54808	-3.777	0.009	-2.921	3.346e-4	-3.285	0.002	-2.324	0.019	-3.430	0.004
FBXL17	64839	-3.889	0.008	-3.254	0.003	-2.672	0.025	-3.183	0.007	-3.860	0.009
KIF20A	10112	-3.985	0.004	-4.657	4.000e-5	-3.787	6.220e-5	-2.208	0.009	-2.616	0.007
FTO	79068	-4.043	0.002	-2.807	1.332e-4	-2.485	0.010	-2.854	0.002	-3.430	0.002
FAM172A	83989	-4.045	0.004	-2.516	0.006	-4.156	0.003	-3.333	0.009	-6.955	1.316e-4
TRAPPC9	83696	-4.092	9.468e-4	-3.849	1.000e-6	-2.764	0.028	-2.455	0.028	-3.692	0.009
BRE	9577	-4.120	9.806e-4	-3.126	1.680e-5	-3.008	0.004	-2.300	0.016	-3.080	0.009
NCCRP1	342897	-4.129	0.001	2.368	0.024	2.129	0.024	2.558	0.008	6.113	4.140e-5
MSRA	4482	-4.173	0.005	-4.730	2.251e-4	-4.544	0.004	-3.485	0.007	-5.502	0.003
ADK	132	-4.189	0.008	-5.089	1.480e-6	-2.590	0.002	-1.858	0.016	-3.353	2.547e-4
COMMD10	51397	-4.196	0.007	-4.164	2.430e-5	-3.275	0.007	-2.940	0.008	-4.410	0.002
COMMD1	150684	-4.206	0.005	-2.507	0.010	-3.851	0.003	-2.609	0.020	-3.418	0.015
STX8	9482	-4.241	0.002	-3.565	6.590e-5	-4.505	1.583e-4	-2.649	0.020	-4.800	6.744e-4
CASK	8573	-4.246	0.009	-2.792	0.007	-3.026	0.003	-2.313	0.015	-3.423	0.002
ANO4	121601	-4.277	0.017	-3.960	5.994e-4	-2.253	0.032	-1.818	0.036	-2.470	0.037
XRCC4	7518	-4.341	0.025	-2.808	0.018	-4.330	0.003	-3.113	0.012	-3.736	0.008
FAF1	11124	-4.377	0.002	-3.382	1.940e-5	-3.007	0.003	-2.098	0.019	-3.582	0.001
TMEM117	84216	-4.426	4.287e-4	-3.725	5.920e-5	-4.517	0.005	-3.255	0.011	-4.200	0.015
FARS2	10667	-4.469	0.010	-5.266	3.880e-5	-3.334	0.006	-3.201	0.007	-3.595	0.011
ELP4	26610	-4.510	0.025	-4.025	0.001	-3.238	0.013	-2.399	0.046	-4.102	0.008
C16orf45	89927	-4.521	0.004	-2.830	0.003	-3.207	0.013	-3.768	0.008	-3.237	0.031
DENND1A	57706	-4.570	0.005	-4.218	7.912e-4	-3.137	0.007	-2.866	0.012	-4.975	5.422e-4
NUBPL	80224	-4.612	0.010	-2.934	0.008	-2.989	0.010	-2.800	0.009	-4.643	8.411e-4
ARL15	54622	-4.635	0.019	-3.870	0.004	-3.490	0.005	-2.514	0.048	-3.736	0.016
SLC2A13	114134	-4.684	0.001	-2.949	0.002	-3.669	0.018	-3.958	0.013	-4.215	0.036
TBC1D5	9779	-4.687	7.410e-5	-3.969	1.000e-6	-3.804	6.090e-5	-2.448	0.005	-4.818	5.960e-6
SNX29	92017	-4.701	0.001	-2.950	0.003	-2.784	0.012	-3.561	3.176e-4	-4.357	5.350e-4
BCAS3	54828	-4.898	9.280e-5	-2.974	3.340e-5	-4.354	0.003	-3.250	0.018	-4.457	0.008
LARGE	9215	-5.028	2.197e-4	-4.897	1.000e-6	-4.119	0.006	-4.102	0.004	-6.234	0.001
XYLT1	64131	-5.158	0.022	-4.187	0.003	-2.829	0.024	-3.206	0.002	-3.969	0.006
CDKAL1	54901	-5.217	0.009	-3.876	0.001	-2.736	0.036	-2.986	0.016	-3.369	0.023
EXOC4	60412	-5.241	1.470e-5	-3.903	1.000e-6	-3.442	1.939e-4	-3.160	3.518e-4	-4.447	7.150e-5
ATG10	83734	-5.351	0.015	-3.715	0.008	-3.104	0.044	-3.073	0.047	-4.198	0.019
LPP	4026	-5.351	2.370e-5	-3.234	2.610e-6	-3.167	2.424e-4	-2.628	9.884e-4	-3.994	1.171e-4
PRKCA	5578	-5.375	2.885e-4	-4.192	1.420e-5	-4.107	0.006	-2.745	0.023	-4.599	0.008
GPHN	10243	-5.426	8.728e-4	-6.132	1.000e-6	-3.860	9.580e-4	-3.790	2.098e-4	-4.639	4.281e-4
CAMKMT	79823	-5.553	0.004	-5.018	3.253e-4	-4.959	0.007	-3.150	0.036	-3.732	0.043
CNTN1	1272	-5.624	0.030	-6.057	0.006	-2.900	0.003	-2.836	0.001	-3.982	4.550e-5
GTDC1	79712	-5.646	0.008	-4.173	6.903e-4	-4.290	0.002	-2.808	0.043	-5.472	0.003
BBS9	27241	-5.740	0.001	-3.622	0.002	-3.362	0.014	-3.799	0.012	-4.753	0.010
TTC28	23331	-5.943	0.001	-5.529	3.258e-4	-3.637	0.015	-5.858	0.004	-4.751	0.006
GMDS	2762	-6.713	3.729e-4	-4.768	7.730e-5	-3.771	0.001	-3.493	0.002	-4.585	4.392e-4
SMYD3	64754	-6.791	5.190e-5	-4.031	9.600e-5	-4.000	0.004	-3.233	0.014	-6.356	4.224e-4
CPS1	1373	-7.201	9.301e-4	-3.373	0.003	-4.432	1.190e-5	-3.586	7.079e-4	-5.270	8.360e-5

Supplemental Table 4. UVR-induced changes in the level of p53 gene expression (FPKM values) under different UVB conditions in three individual keratinocyte lines (K) and two melanocyte (M) lines.

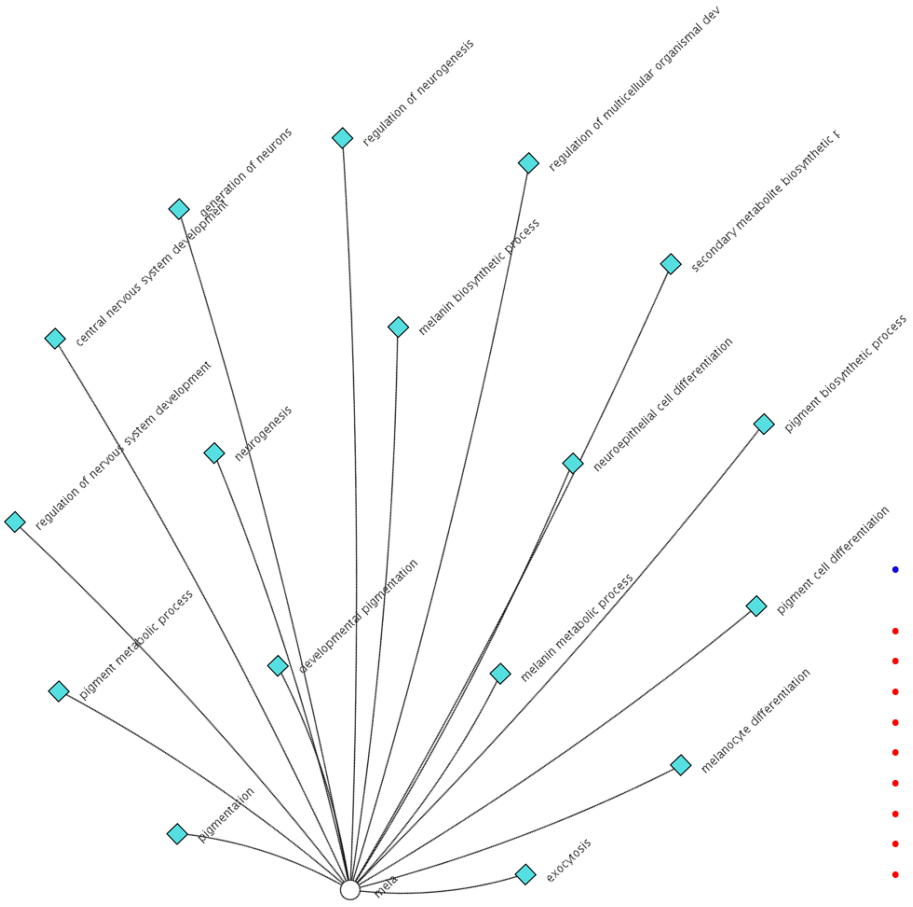
	Con	10 mJ/cm^2 24h	20 mJ/cm^2 24h	30 mJ/cm^2 24h	10 mJ/cm^2 72h	20 mJ/cm^2 72h	30 mJ/cm^2 72h
K1	20.043	36.783	32.145	24.923	36.638	30.12	22.578
K2	31.027	29.054	31.385	30.15	24.496	19.689	17.84
K3	28.599	28.559	29.264	20.68	23.065	18.522	14.205
M2	26.133	22.586	26.496	35.437	17.462	14.711	18.512
M3	17.932	32.651	36.06	34.706	15.06	16.381	20.238

Supplemental Figure 1. GO analysis using DAVID or ToppGene software suites showing that genes more highly expressed in keratinocytes than in melanocytes fall into keratinocyte-specific biological pathways.

DAVID GO terms:

- Desmosome
- Epidermis development
- Keratinocyte proliferation
- Epithelial cell differentiation
- Epidermolysis bullosa
- Palmoplantar keratoderma
- Ectodermal dysplasia
- Basement membrane

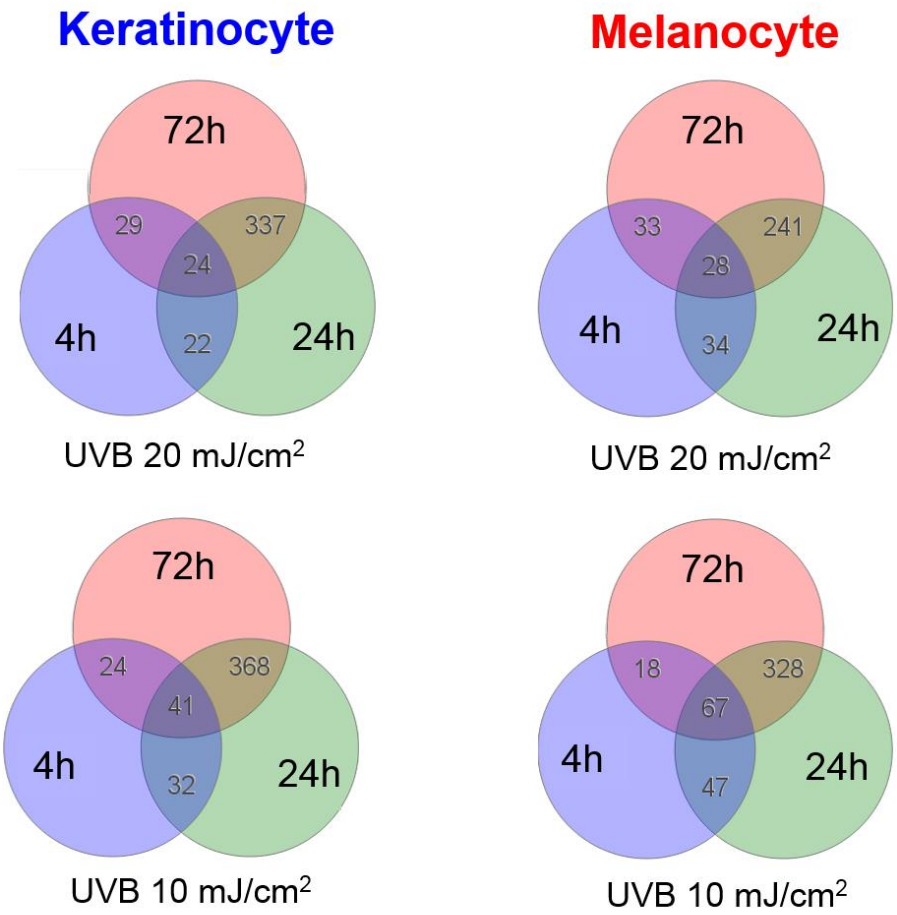
Supplemental Figure 2. GO analysis using DAVID or ToppGene software suites showing that genes more highly expressed in melanocytes than in keratinocytes fall into melanocyte-specific biological pathways.



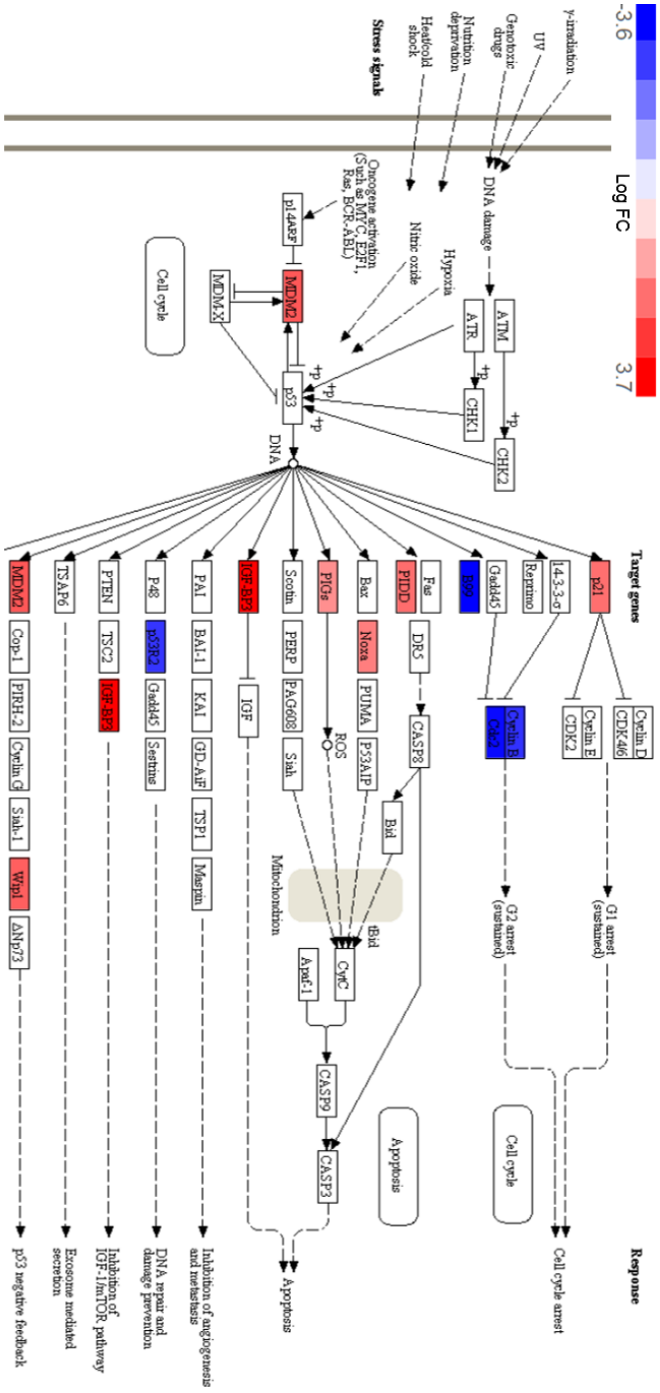
- DAVID GO terms:

- Melanosome
- Pigmentation
- Melanocyte differentiation
- Pigment cell differentiation
- Pigment metabolic process
- Neurodegeneration
- Cellular pigmentation
- Pigment biosynthetic process
- Melanosome organization

Supplemental Figure 3. UVB-induced DEG set at 4h had minimal overlap with DEG sets at 24h or 72h, whereas the overlap between 24h and 72h UVB-induced DEG sets is much larger in both melanocytes and keratinocytes in response to two different UVB doses (10 and 20 mJ/cm^2).



Supplemental Figure 4A. UVB induced dysregulation of p53 target genes in keratinocytes 24h post 30mJ/cm^2 of UVR.



Supplemental Figure 4B. UVB induced dysregulation of p53 target genes in melanocytes 24h post 30mJ/cm^2 of UVR.