

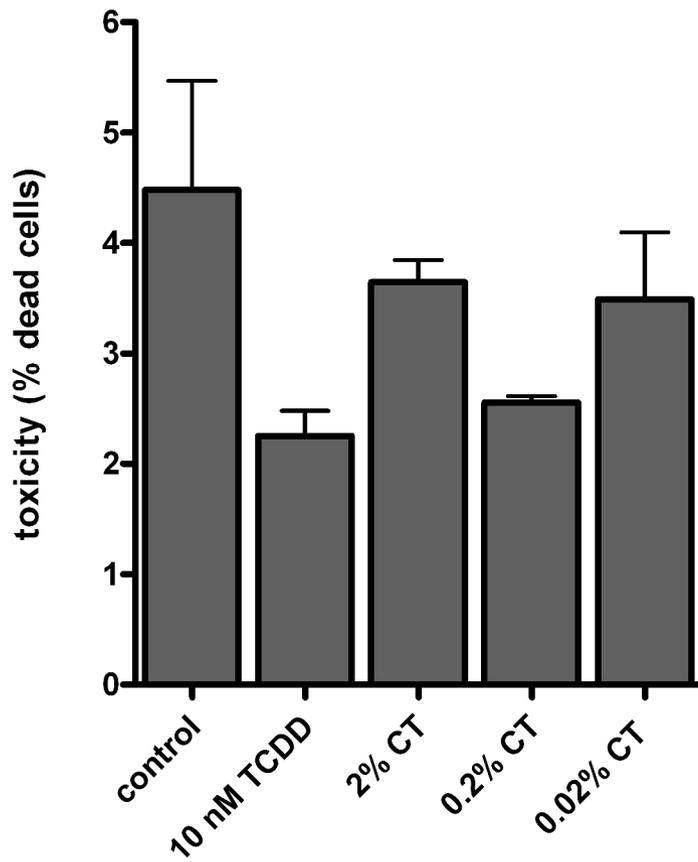
SUPPLEMENTARY FIGURE LEGENDS

Supplementary Figure 1: No toxic effects of coal tar formulations on primary human keratinocytes. (a) Keratinocytes were stimulated with various concentrations of the coal tar formulation for 48 hours and conditioned culture medium was assessed for the presence of lactate dehydrogenase. The percentage of cell death was relative to keratinocytes treated with 1% Triton-X/PBS, which was set at 100%. (b) Blocking of specific nuclear AhR staining by human recombinant AhR protein in coal tar treated keratinocytes.

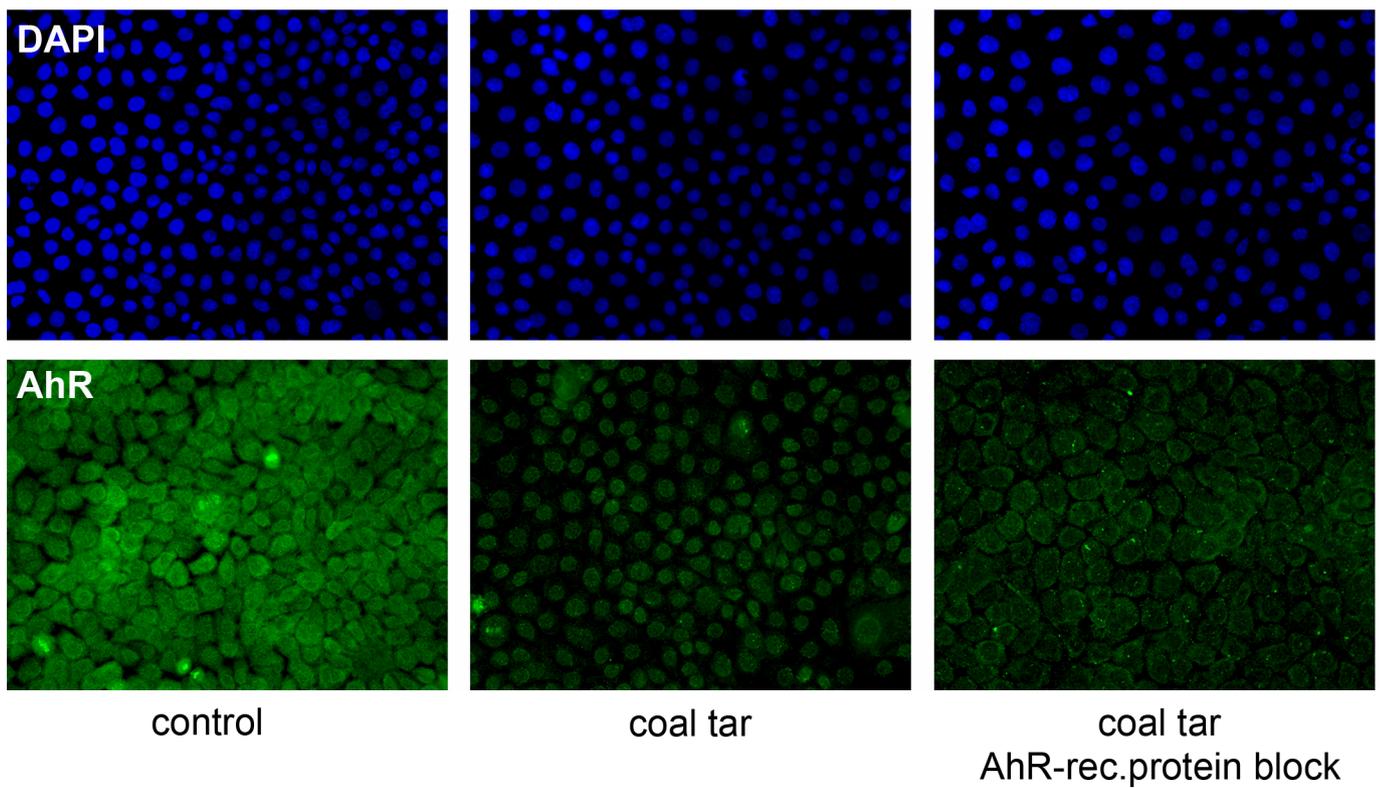
Supplementary Figure 2: Time dependent CYP450 expression levels after coal tar stimulation. *CYP1A1* mRNA expression levels after stimulation with TCDD or a 2% coal tar formulation. Expression levels are relative to untreated (control) keratinocytes. Bars indicate mean \pm SEM, N=3

Supplementary Figure 3: Induced epidermal differentiation expression levels after coal tar stimulation. mRNA expression levels of epidermal differentiation genes after 48 hours stimulation with TCDD or a coal tar concentration series. Expression levels are relative to untreated (control) keratinocytes. Bars indicate mean \pm SEM, N=3

A

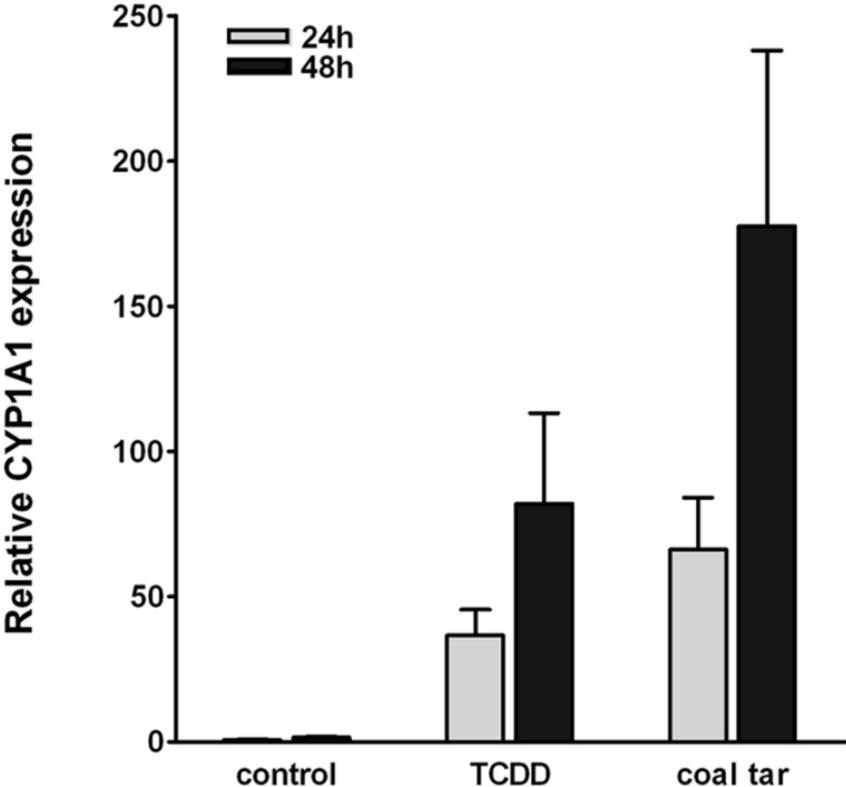


B



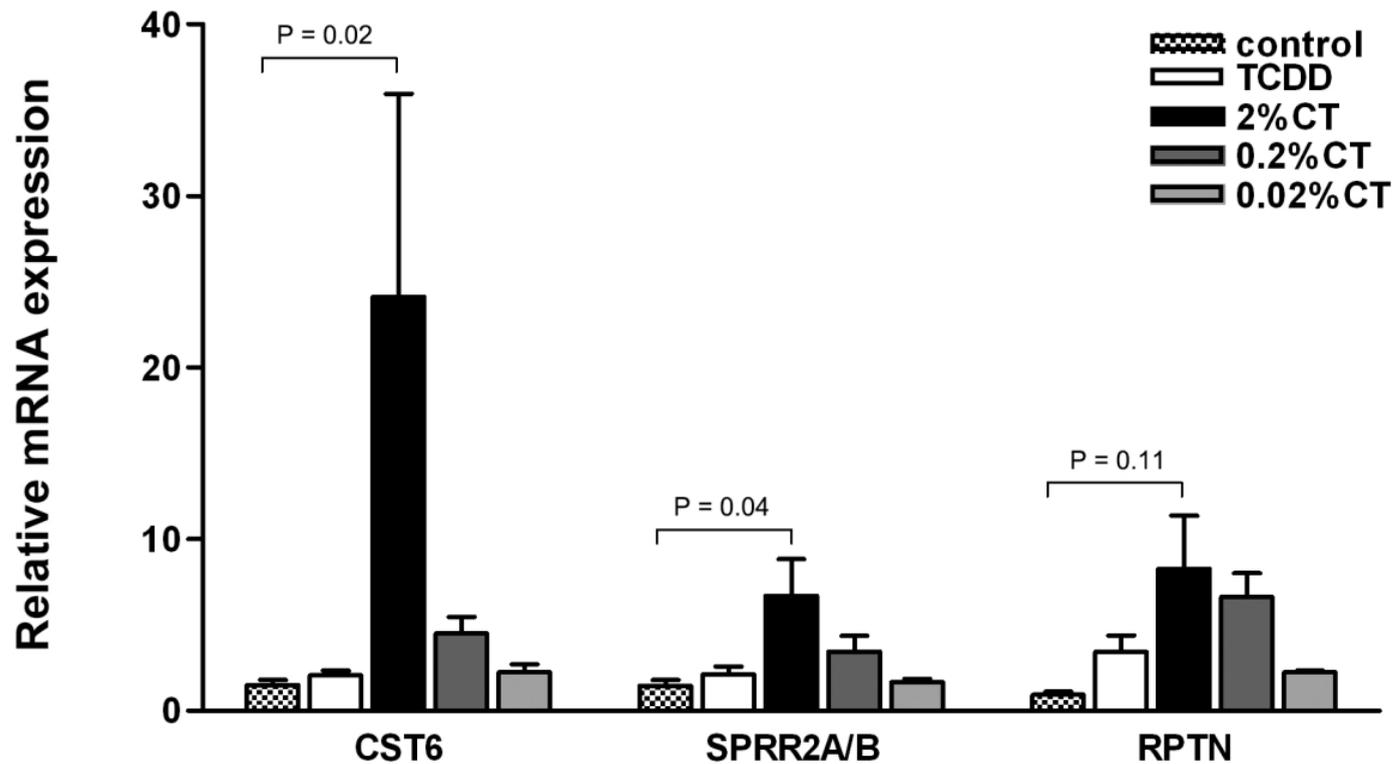
Supplemental figure 2

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Supplemental figure 3

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Supplementary Table 1: Epidermal differentiation levels after AhR knockdown. Keratinocytes were stimulated with coal tar after AhR knockdown. Expression levels are relative to mock-treated, coal tar-stimulated keratinocytes. P values in bold are considered statistically significant. N=3.

Gene	Abbreviation	Relative expression (mean \pm SD)	P value
Hornerin	HRNR	0.46 \pm 0.03	0.003
Filaggrin	FLG	0.40 \pm 0.07	0.002
Filaggrin family member-2	FLG2	0.14 \pm 0.03	0.01
Small proline rich repeat 2A/B	SPRR2A/B	0.61 \pm 0.05	0.01
Involucrin	IVL	0.68 \pm 0.06	0.02
Loricrin	LOR	0.65 \pm 0.09	0.03
Transglutaminase-1	TGM1	0.76 \pm 0.21	0.12
Cystatin M/E	CST6	0.89 \pm 0.21	0.44
Keratin 10	K10	1.70 \pm 0.45	0.08
Keratin 14	K14	1.52 \pm 0.10	0.08
Keratin 5	K5	1.32 \pm 0.43	0.37

Supplementary Table 2: Filaggrin mutation analysis. Primary human keratinocytes obtained from healthy volunteers or AD patients were analyzed for the two most common *FLG* mutations, p.R501X (c.1501C>T) and c.2282del4. Intact allele is depicted as '1', mutation as '0'.

Patient status	p.R501X (c.1501C>T)	c.2282del4
Healthy (N=3)	1	1
AD (N=3)	0	1