Genes	The names and sequences of primers(5′-3′)	Length of amplified fragments (bp)
CYP52-M1	373ruler-F: CTTCGCTATTCATTTCCTTGC	507
	373ruler-R: GGGAAGTCGGGACCCATCT	
CYP52-N1	1566ruler-F: GATTCTTTATGCTGTGCTGGG	602
	1566ruler-R: TGACCTCCAACGAGCCAAC	
CYP52-N2	760ruler-F: CTAAACTCACGAGAGACCCCTT	677
	760ruler-R: ACTCAGTTTTACTCGGACGCC	
CYP52-E1	400ruler-F: TCACTAAGGAGACTTCTGACCCA	679
	400ruler-R: ATGAATCTCGCCATCACGCC	
CYP52-E2	554ruler-F: GTGCCTACCCTGAGGTCTACG	459
	554ruler-R: ACTCTTGGCAGATACGCACG	
CYP-X	3841ruler-F: TACGGCAAGAAGATTACTGACAT	646
	3841ruler-R: GCAGCATAACATACTTCTGACCC	
*actin**	actin-ruler-F: TGGGAGCACGAAGATGACAG	425
	actin-ruler-F: CCTGCCATCATGTCCTTCTG	

Supplementary Table 1--Primers for cloning of the aim gene fragments; *housekeeping gene. With the expression of housekeeping gene actin as the internal standard, calibration was carried out on the expression of target genes.

Genes	The names and sequences of primers (5′-3′)	Length of amplified fragments (bp)
CYP52-M1	373RT-F: ATTGCCATTGAACTTCCGTA	147
	373RT-R: CCCCAATACTTGATGTCCCT	

CYP52-N1	1566RT-F: ACTCACCCTGGTAGTTCTCTCG	165
	1566RT-R:TTGGTGGATAGAACAGCCTTG	
CYP52-N2	760RT-F: ACCTACCCGTTTTCGTTCC	105
	760RT-R: CAGGGTTGAAGTCATACGAGTC	
CYP52-E1	400RT-F: CCCTCGCATTTGTATCGGT	135
	400RT-R: CGCTGCTTCATCTCTTTCCT	
CYP52-E2	554RT-F: GGGTCCTGACTCCACAACATT	115
	554RT-R: CTGACCCAGGCAAATACGAG	
CYP-X	3841RT-F:TCCCTACATTACACCCATCCAT	168
	3841RT-R:GCAGCATAACATACTTCTGACCC	
*actin**	actin-RT-F: GTCATCTGCTCAACGAAGTGTAT	112
	actin-RT-R: ATGTCCTTCTGAGCGGTCTG	

Supplementary Table 2. Primers for real-time fluorescent quantitative PCR (RT-qPCR); *housekeeping gene. With the expression of housekeeping gene *actin* as the internal standard, calibration was carried out on the expression of target genes.

Genes	Equations of standard curves	R^2
CYP52-M1	$y = -0.3082x + 11.039$	0.9961
CYP52-N1	$y = -0.2914x + 10.83$	0.9906
CYP52-N2	$y = -0.3036x + 11.339$	0.9989
CYP52-E1	$y = -0.3309x + 11.422$	0.9949
CYP52-E2	$y = -0.3096x + 10.859$	0.9986
CYP-X	$y = -0.3278x + 11.226$	0.9978
*actin**	$y = -0.292x + 11.97$	0.994

Supplementary Table 3. Equations of standard curves of RT-qPCR
*housekeeping gene. With the expression of housekeeping gene actin as the internal standard, calibration was carried out on the expression of target genes.

Samples	RT (time)	MW	Inferred structures of SLs
C8	36.1	690	C18:0, 2Ace*, Lac† SL
C10	36.0	690	C18:0, 2Ace, Lac SL
C12	36.1	690	C18:0, 2Ace, Lac SL
C14	36.1	690	C18:0, 2Ace, Lac SL
C16	21.6	622	C18:1, 0Ace, Acid‡ SL
	30.2	660	C16:1, 2Ace, Lac SL
	32.0	646	C18:1, 1Ace, Lac SL
	33.1	646	C18:1, 1Ace, Lac SL
	36.0	690	C18:0, 2Ace, Lac SL
C18	9.1	706	C18:1, 2Ace, Acid SL
OA	9.1	706	C18:1, 2Ace, Acid SL
	11.2	666	C18:0, 1Ace, Acid SL
	16.1	706	C18:1, 2Ace, Acid SL
	18.0	708	C18:0, 2Ace, Acid SL
	28.2	688	C18:1, 2Ace, Lac SL
	33.8	690	C18:0, 2Ace, Lac SL

Supplementary Table 4-. Identification of SLs produced in fermentation media with different alkanes or oleic acid (OA) based on m/z peaks of protonated molecular ion
*acetylated, †lactonic, ‡acidic