**Methods**

The phenotype used in the discovery set was longitudinal total serum bilirubin adjusted for clinic, sex and age using a Bayesian hierarchical model. These measurements are modeled using a lognormal distribution with mean, μ and variance, τ. The mean, μ was adjusted using the following formula:

μ = β0,clinic+βclinic,age(age-mean(age)) + βclinic,sex(sex-mean(sex)) + βpatient

The mean of distribution was modeled such that each clinic has a separate slope and age and gender effect. The patient ,age and gender random effect and intercept were modeled using a normal prior.

βpatient~dnorm(0,τpatient)

β0,clinic~dnorm(alpha.0,τ0)

βage~dnorm(alpha.age,τage)

βsex~dnorm(alpha.sex,τsex)

The mean of the random effects was modeled with a normal distribution and the variance a gamma prior:

alpha.0~ dnorm(200,0.0001)

alpha.age~dnorm(0,0.0001)

alpha.sex~dnorm(0,0.0001)

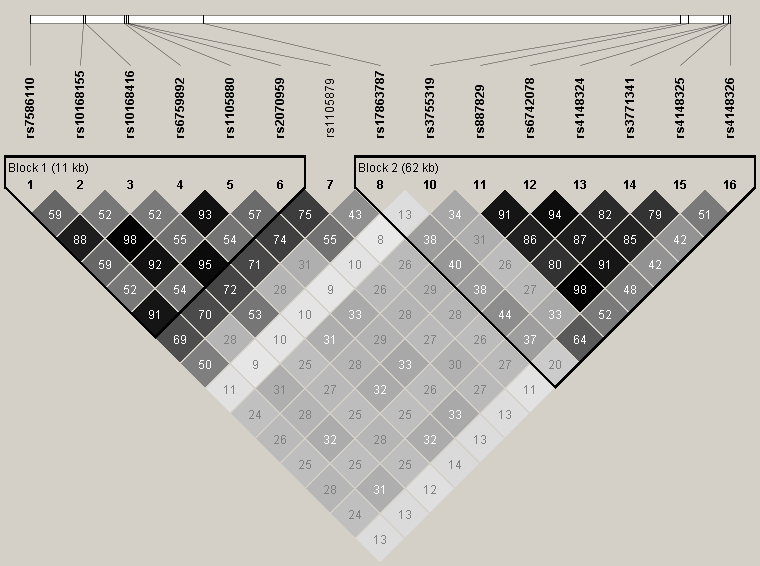
τpatient~dgamma(1,1)

τ0~dgamma(1,1)

τage~dgamma(1,1)

τsex~dgamma(1,1)

Supplementary Figure 1



**Figure 1 LD Structure in CSSCD Cohort.** LD plots for regions in genes *UGT1A1, UGT1A3, UGT1A4, UGT1A5, UGT1A6, UGT1A7, UGT1A8, UGT1A9* and *UGT1A10* on chromosome 2 in the CSSCD subjects. The LD plot was generated using Haploview 4.2. Each diamond represents the r2 value between two SNPs. The LD color scheme is: white r2=0, 0<r2<1 grey (the darker the shade of grey, the higher the r2 value), black r2=1.

Adjusted Analysis

In order to determine if these associations were part of one or multiple signals we performed a SNP set association analysis adjusting for age, sex and our top SNP rs887829. The results can be seen in Supplementary Table 1. After adjusting for our top SNP, none of the SNPs show a significant association with serum bilirubin thus providing evidence that the associations shown in these 16 SNPs are part of one signal.

Supplementary Table 1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| SNP | Chr | BP | Coded Allele | NonCoded Allele | pvalue |
| rs7586110 | 2 | 234255266 | C | A | 0.5148 |
| rs10168155 | 2 | 234261575 | A | G | 0.9454 |
| rs10168416 | 2 | 234261826 | G | C | 0.3274 |
| rs6759892 | 2 | 234266408 | C | A | 0.9348 |
| rs1105880 | 2 | 234266704 | G | A | 0.8925 |
| rs2070959 | 2 | 234266930 | G | A | 0.2368 |
| rs1105879 | 2 | 234266941 | C | A | 0.05988 |
| rs17863787 | 2 | 234275833 | C | A | 0.2617 |
| rs3755319 | 2 | 234332321 | A | C | 0.1526 |
| rs6742078 | 2 | 234337378 | A | C | 0.8188 |
| rs4148324 | 2 | 234337461 | C | A | 0.1547 |
| rs3771341 | 2 | 234337978 | A | G | 0.9155 |
| rs4148325 | 2 | 234338048 | A | G | 0.5338 |
| rs4148326 | 2 | 234338201 | A | G | 0.6086 |