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Genetic and seasonal determinants of vitamin D status in Confederated Salish and Kootenai Tribes (CSKT) participants

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Genetic and seasonal determinants of vitamin D status in Confederated Salish and Kootenai Tribes (CSKT) participants

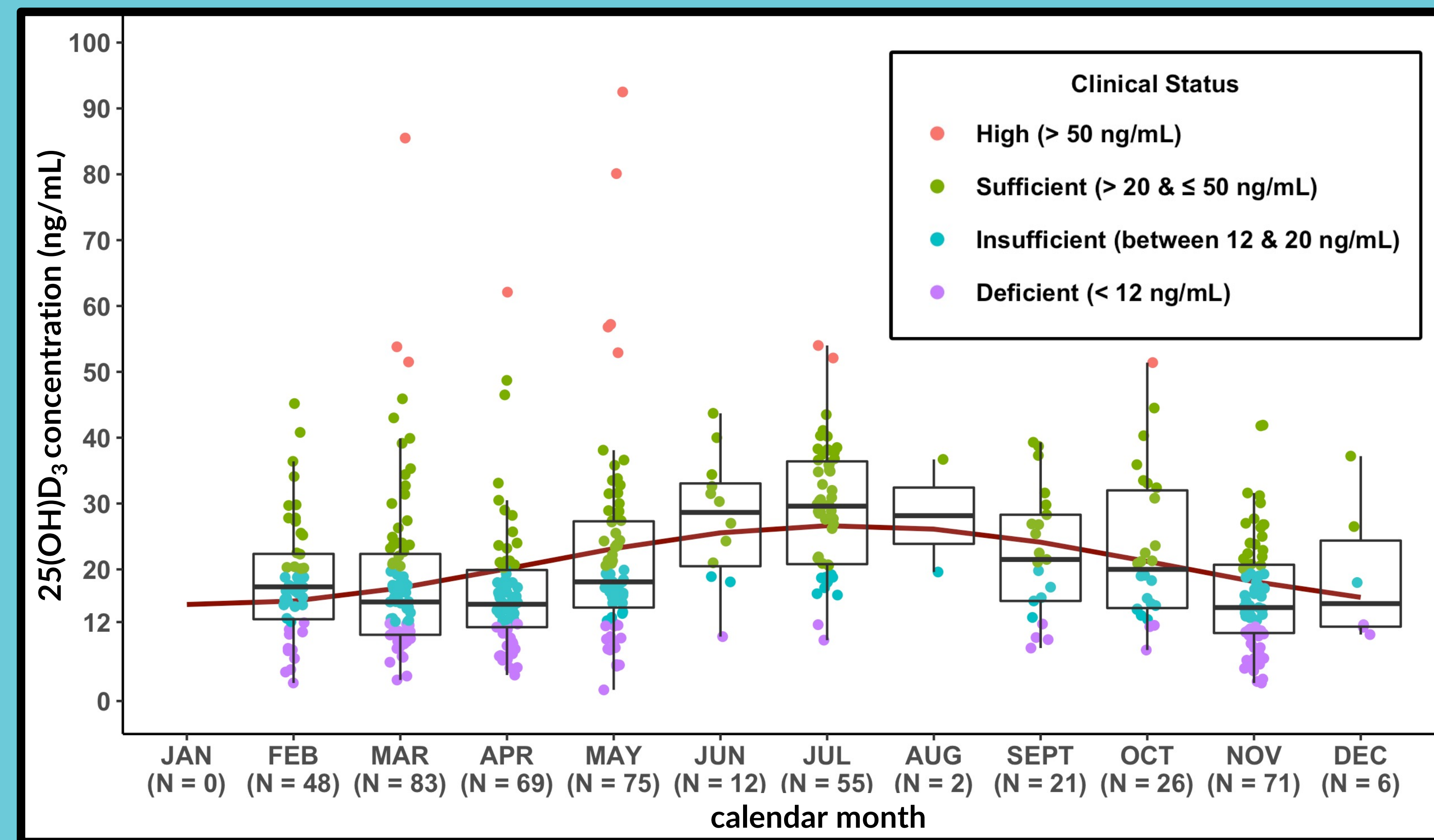


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Background: Vitamin D levels vary globally in human populations due to genetics, geography, and other demographic factors (e.g., age, BMI, and gender). To improve our understanding of contributors to vitamin D levels, we conducted a **candidate-gene study** in partnership with the CSKT.

Methods: Our team traveled over 5,000 total miles to conduct this study.

55% of CSKT had vitamin D levels below sufficiency (< 20 ng/mL)

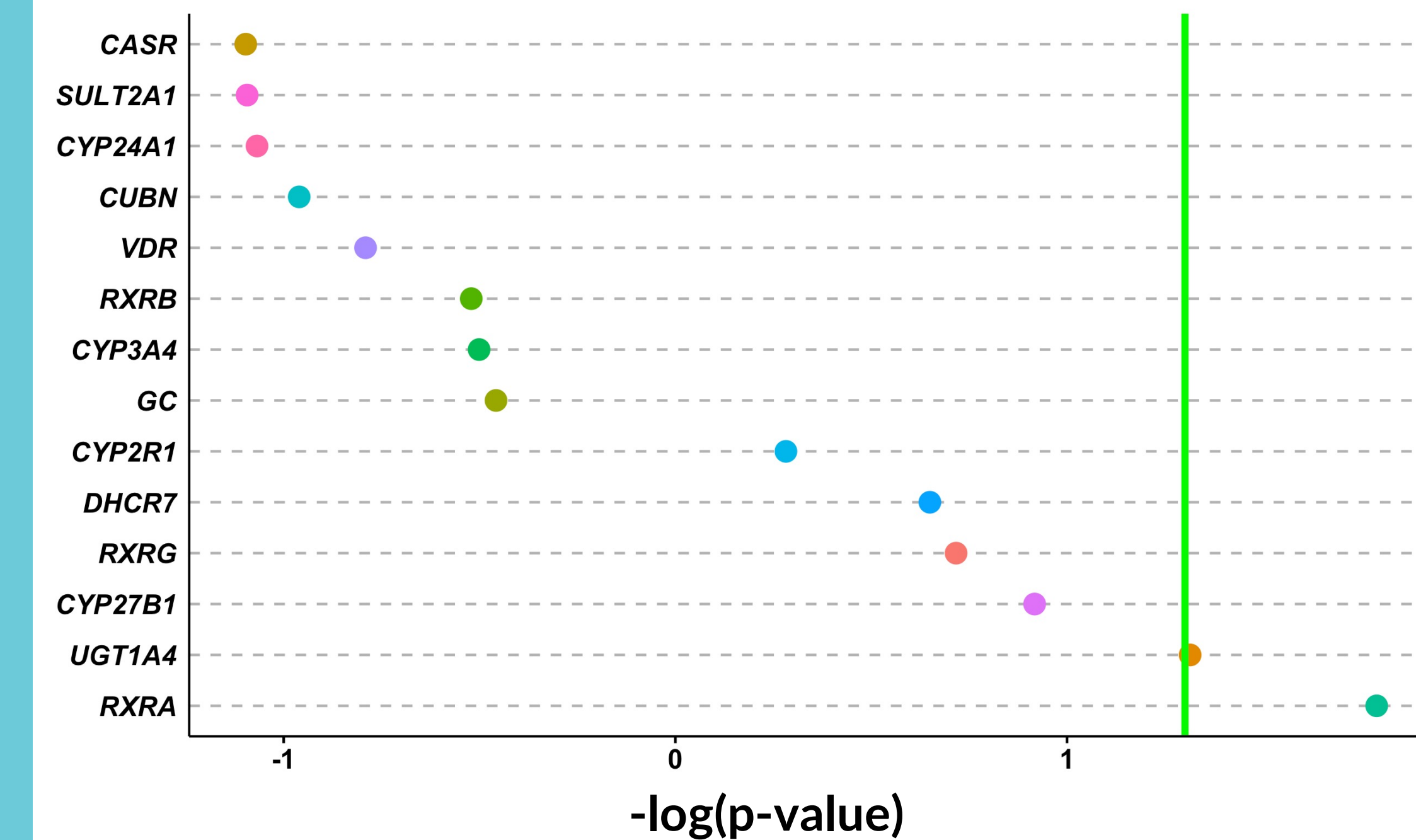


Multivariate regression:
 23% of 25(OH)D₃ variability explained

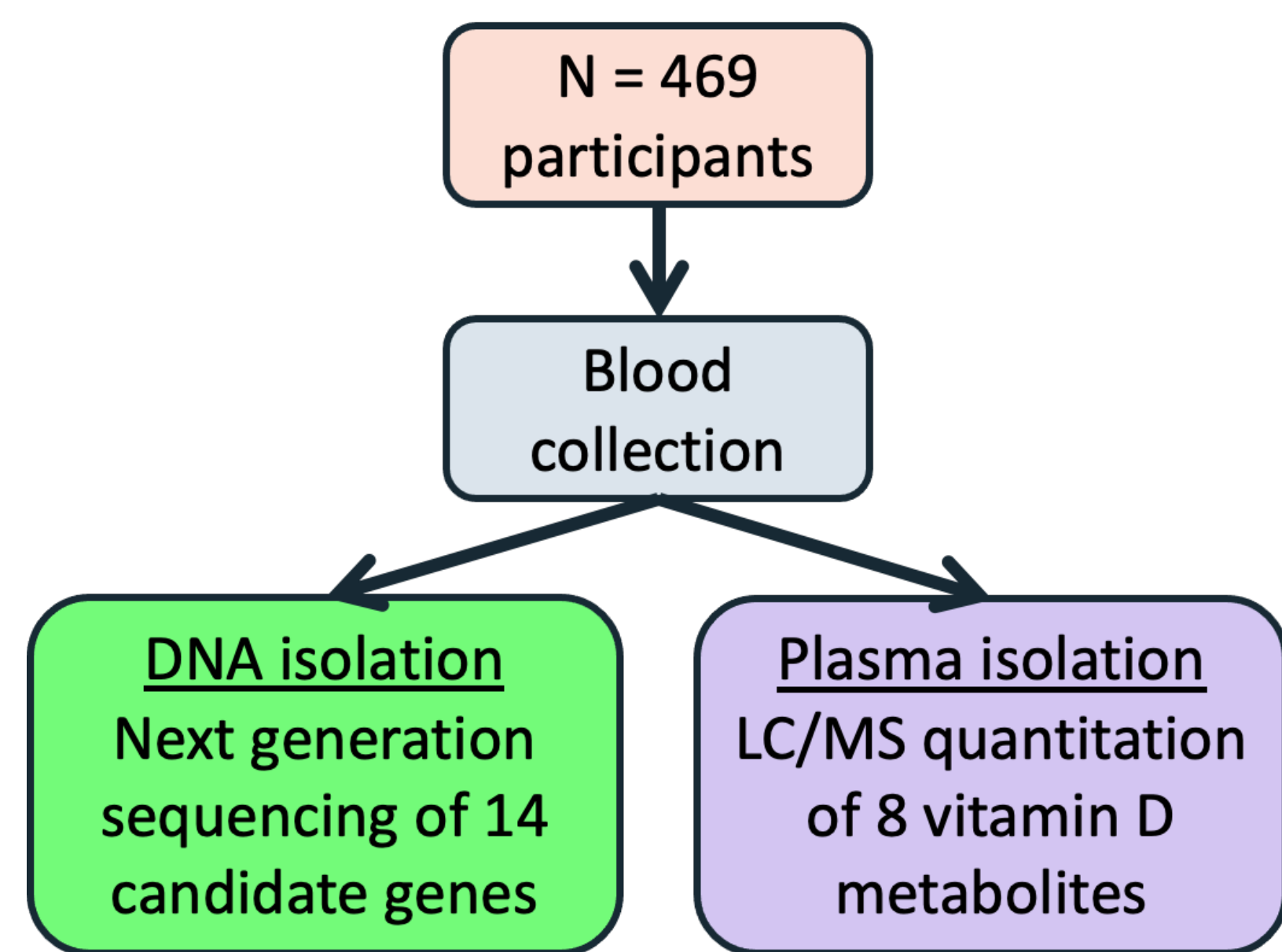
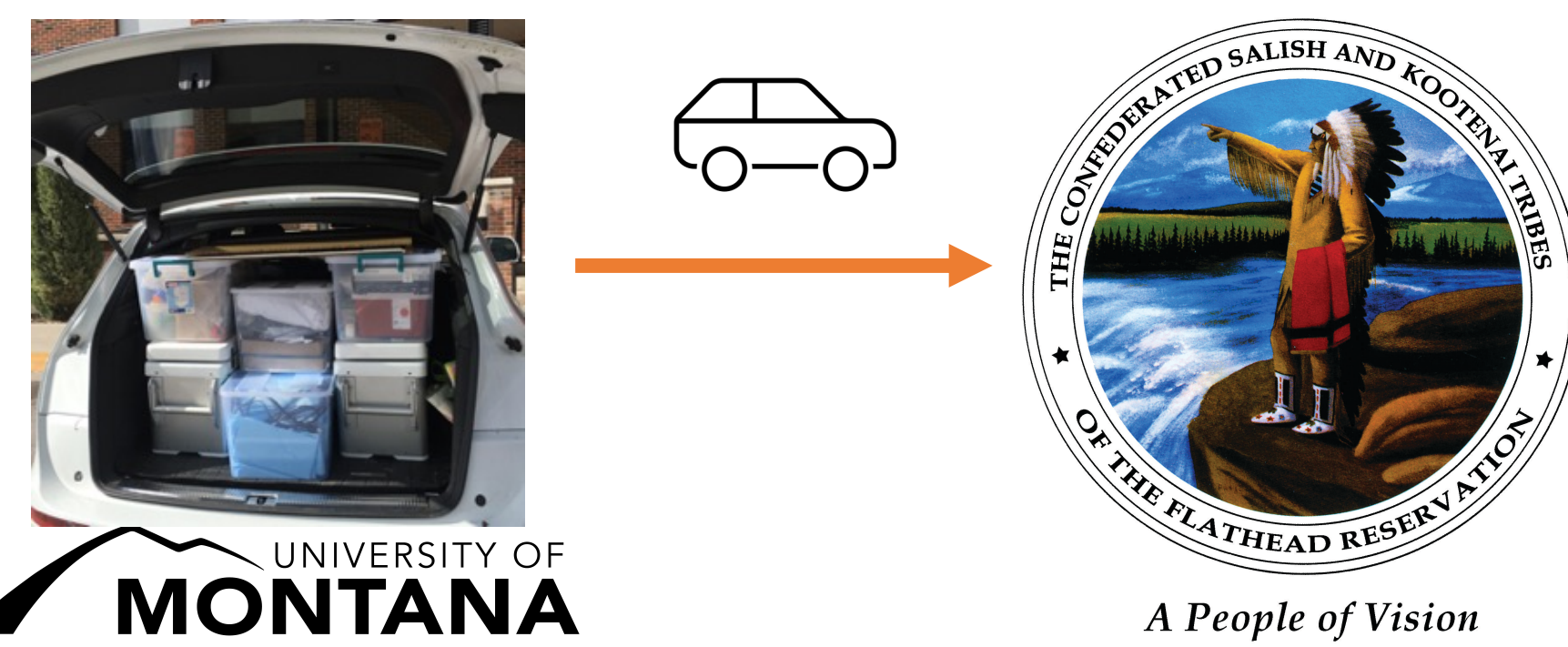
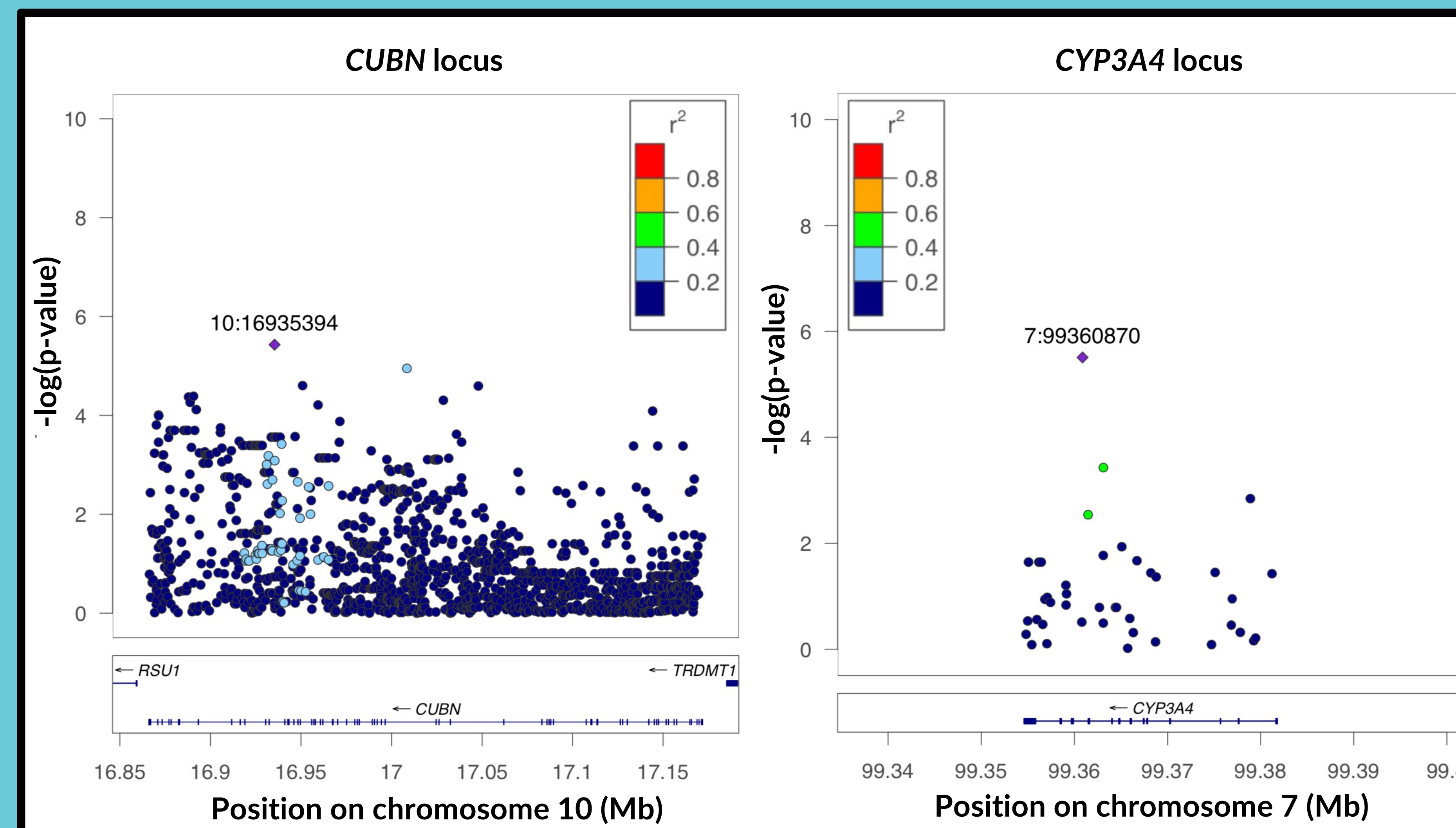
Variant or covariate	Beta ± S.E.	P-value
rs59819645 (CUBN)	-3.94 ± 1.08	0.000307***
rs7089377 (CUBN)	-2.42 ± 0.696	0.00056***
rs34859798 (CUBN)	1.72 ± 0.951	0.0713
rs77520345 (CUBN)	7.34 ± 2.54	0.00398**
rs4646440 (CUBN)	-3.28 ± 0.728	8.33e-06***
Gender = Male	-2.01 ± 0.966	0.0385*
Age	0.104 ± 0.0391	0.00844**
BMI	-0.239 ± 0.0734	0.00125**
Season = Sept.-Nov.	-8.5 ± 1.48	1.63e-08***
Season = Dec.-Feb.	-10.3 ± 1.7	3.24e-09***
Season = Mar.-May	-9.72 ± 1.44	4.63e-11***

*p < 0.05, **p < 0.01, ***p < 0.001

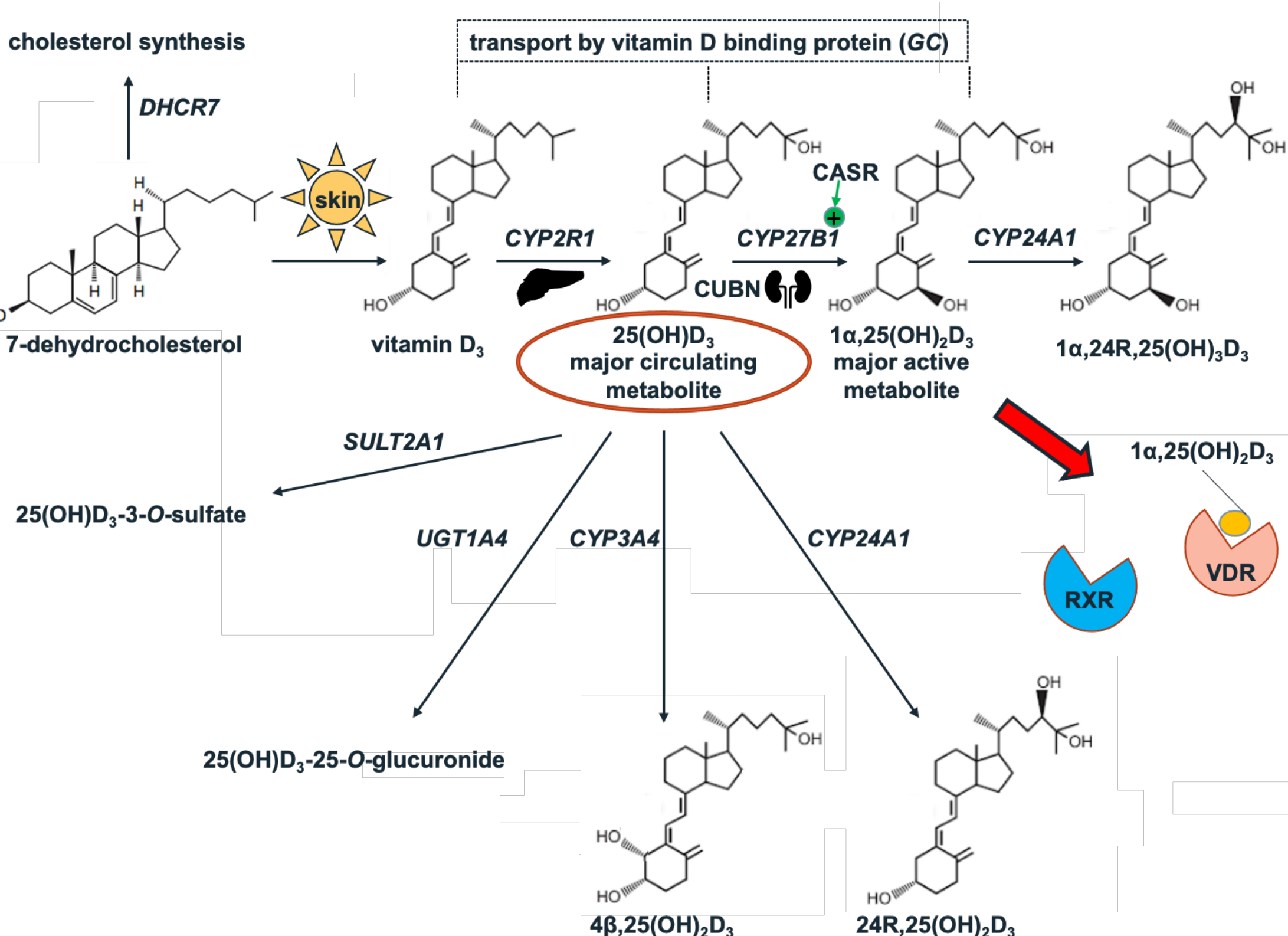
Pooled rare variant analysis of 25(OH)D sufficiency [25(OH)D < 20 ng/mL]:
 significant associations in *UGT1A* and *RXRA*



4 variants in CUBN and 1 variant in CYP3A4 were significantly associated with 25(OH)D₃ concentration



Vitamin D₃ regulatory pathway:



Acknowledgements:

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