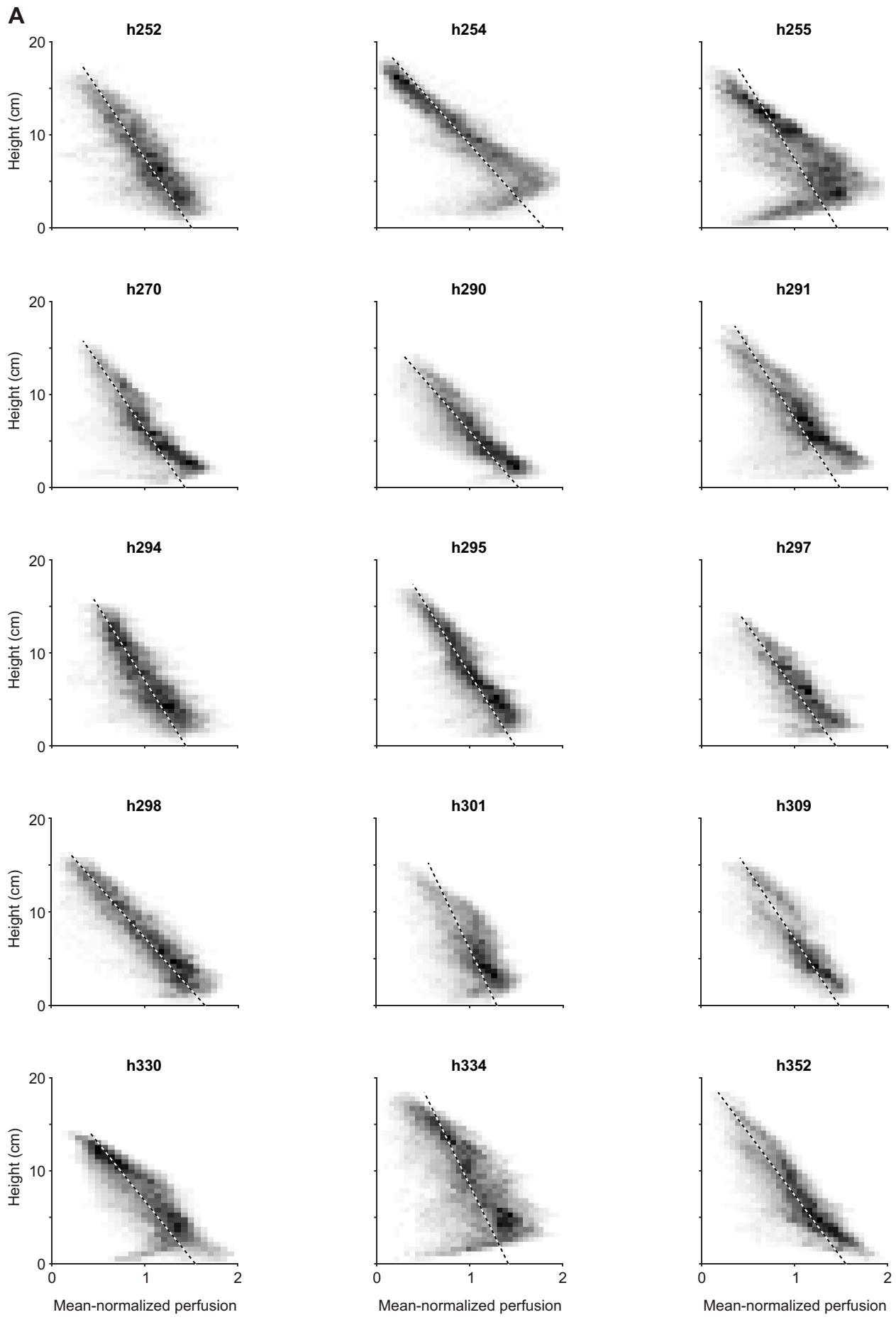
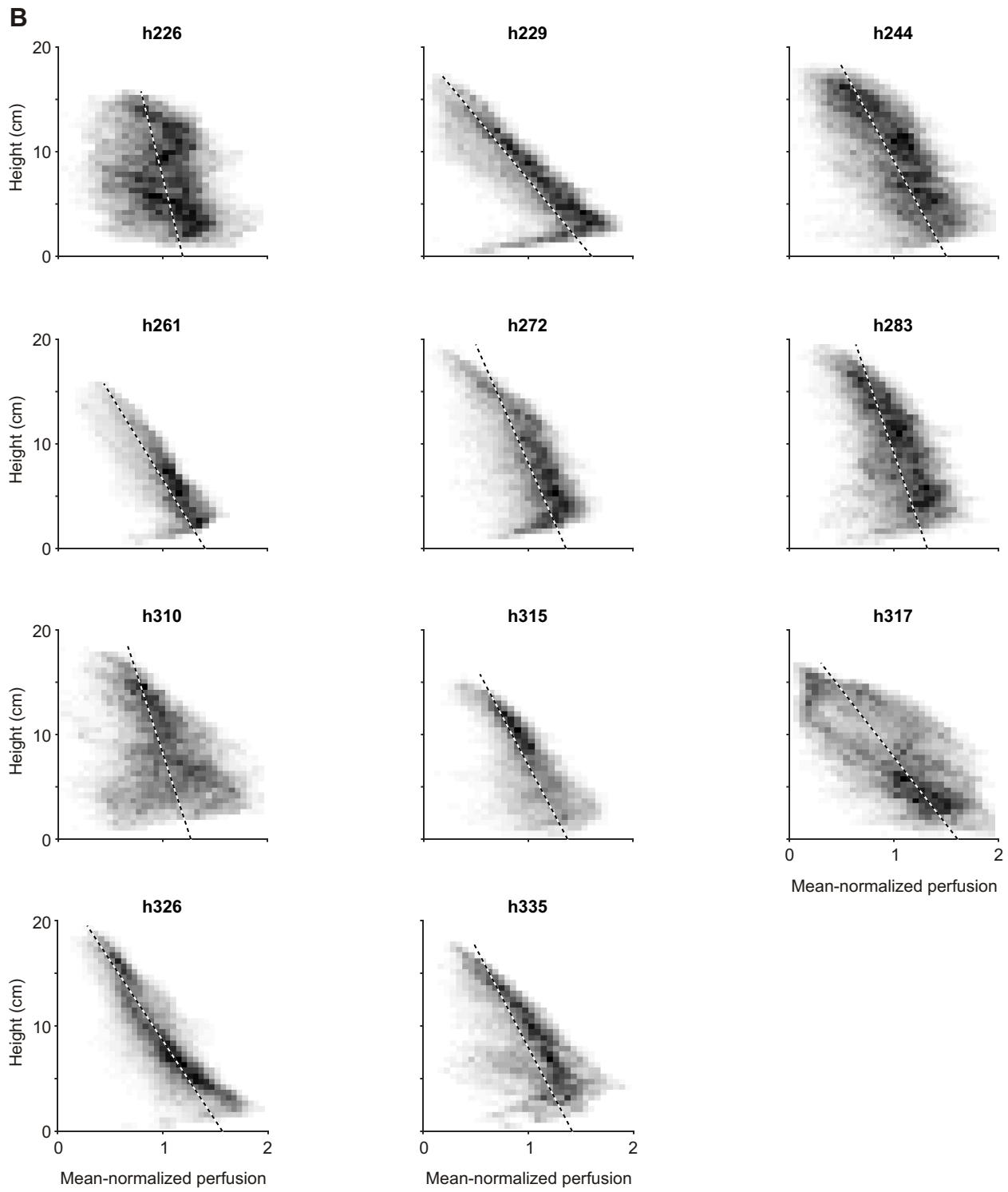
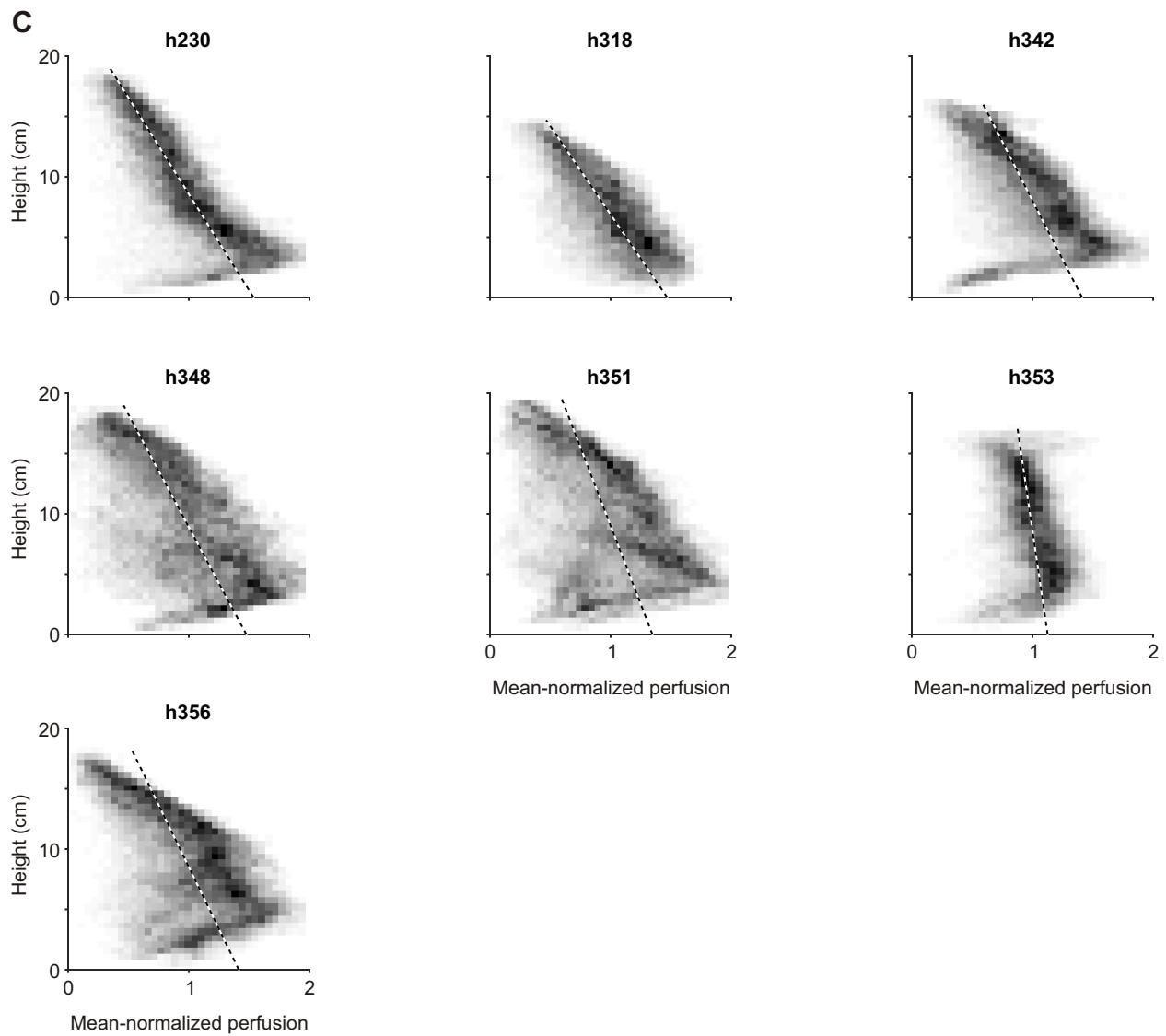


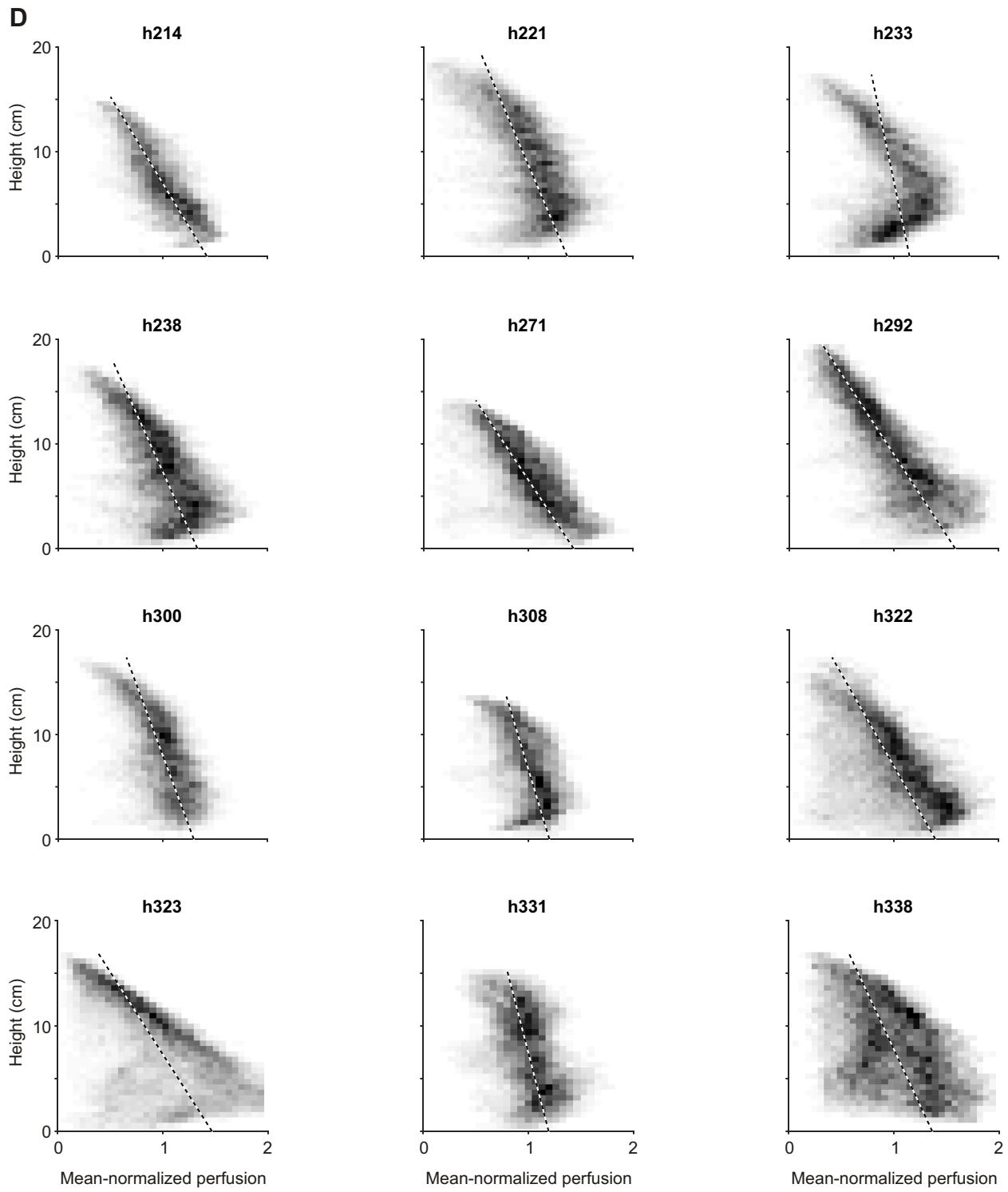
Supplement Figure E1, Panels A-D

Perfusion height maps for all subjects, grouped by HIV infection and smoking status. **Panel A** includes perfusion height maps for controls, **Panel B** for non-smokers living with HIV, **Panel C** for smokers without HIV and **Panel D** for smokers living with HIV. The greatest perfusion heterogeneity, represented by the largest range of perfusion values at any given height, was present in smokers followed by non-smokers living with HIV. The controls had the lowest perfusion heterogeneity, or the most narrow range of perfusion values at any given height. The vertical gradient in perfusion (represented by the slope of the white dashed line) decreased in magnitude most in smokers infected with HIV. Although not statistically significant, there was a step-wise decrement in the magnitude of the vertical gradient of perfusion from controls to non-smokers living with HIV to smokers without infection to smokers living with HIV (**Table 3**), which is also evident visually in these panels.



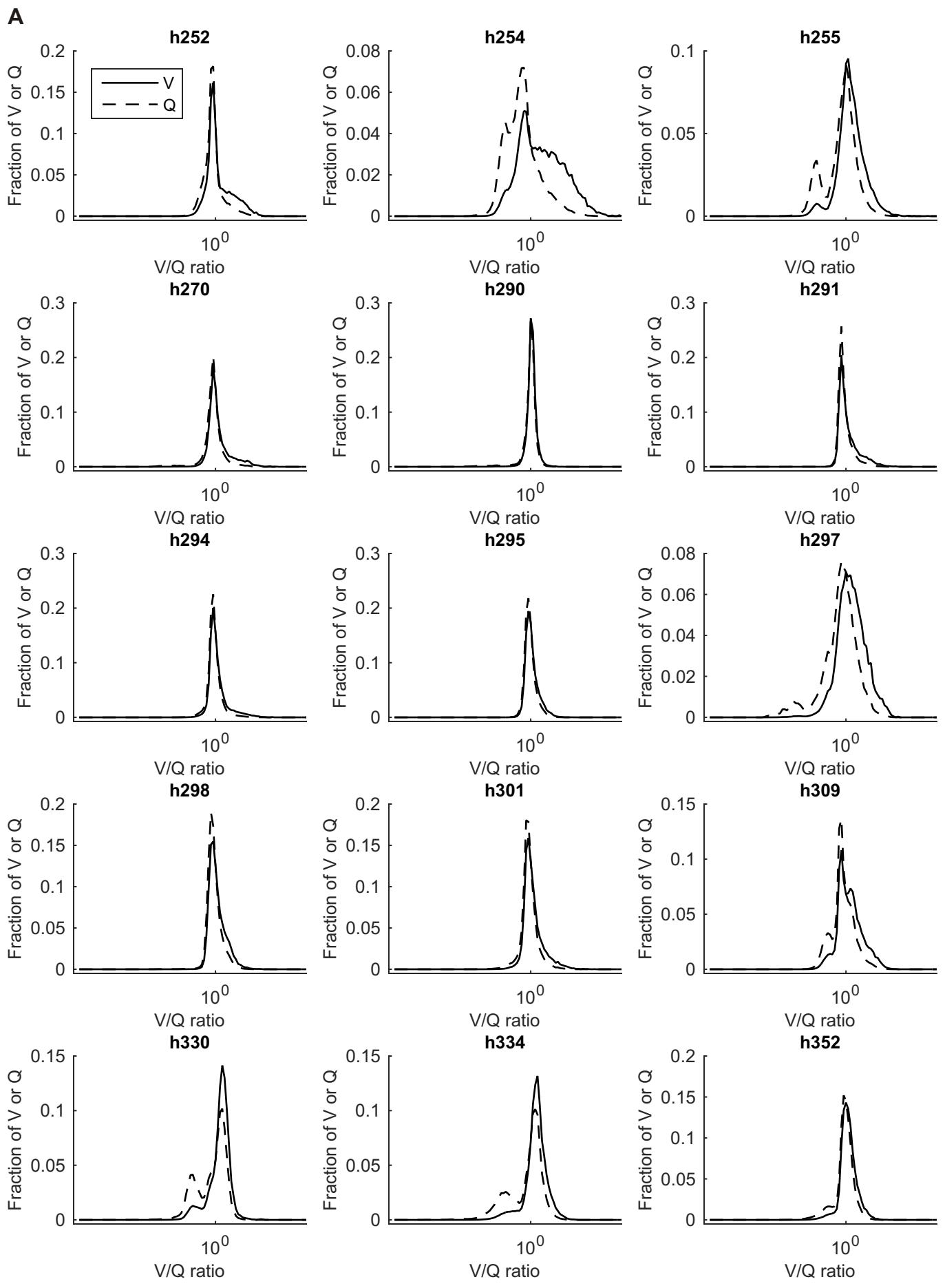


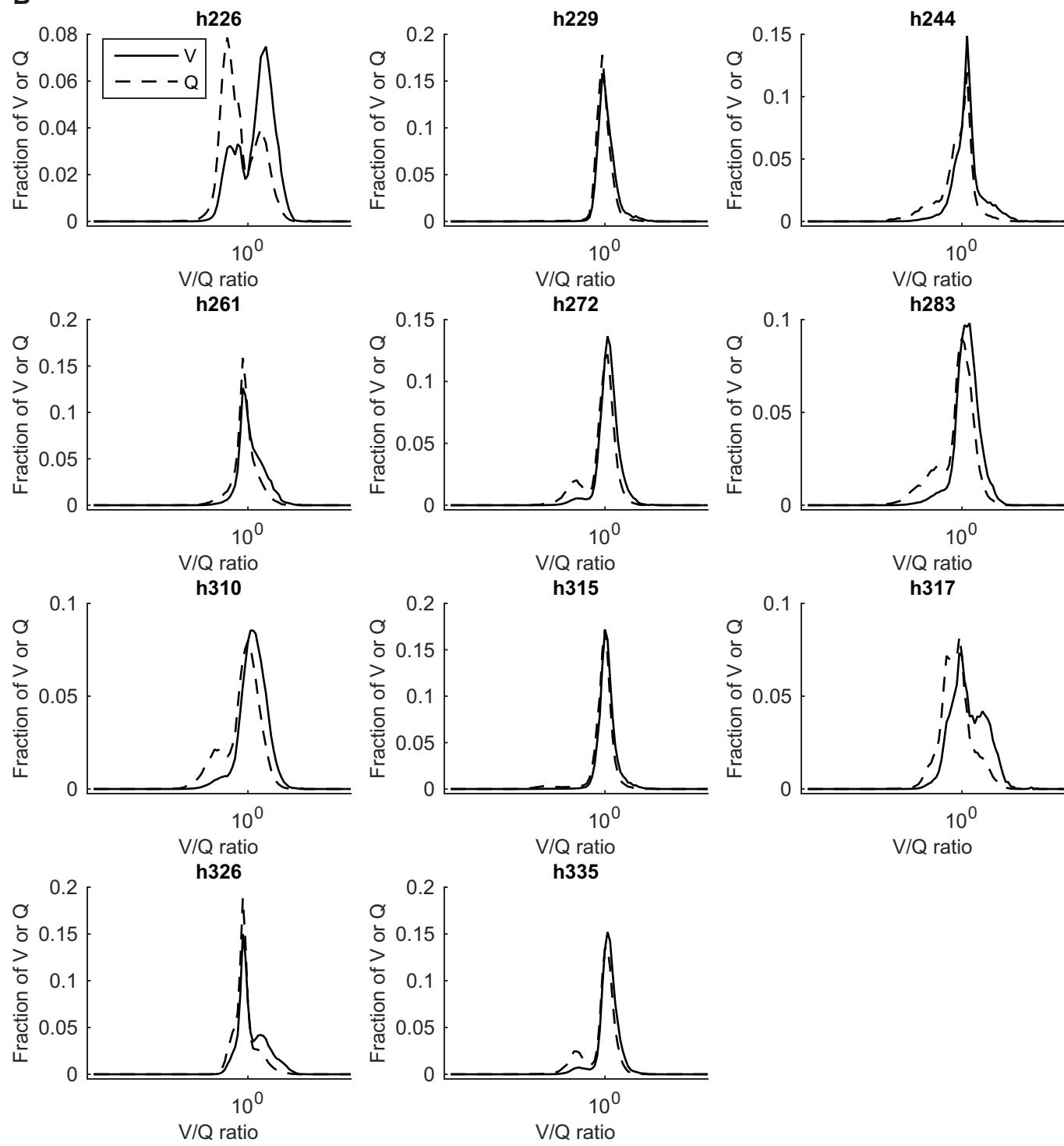


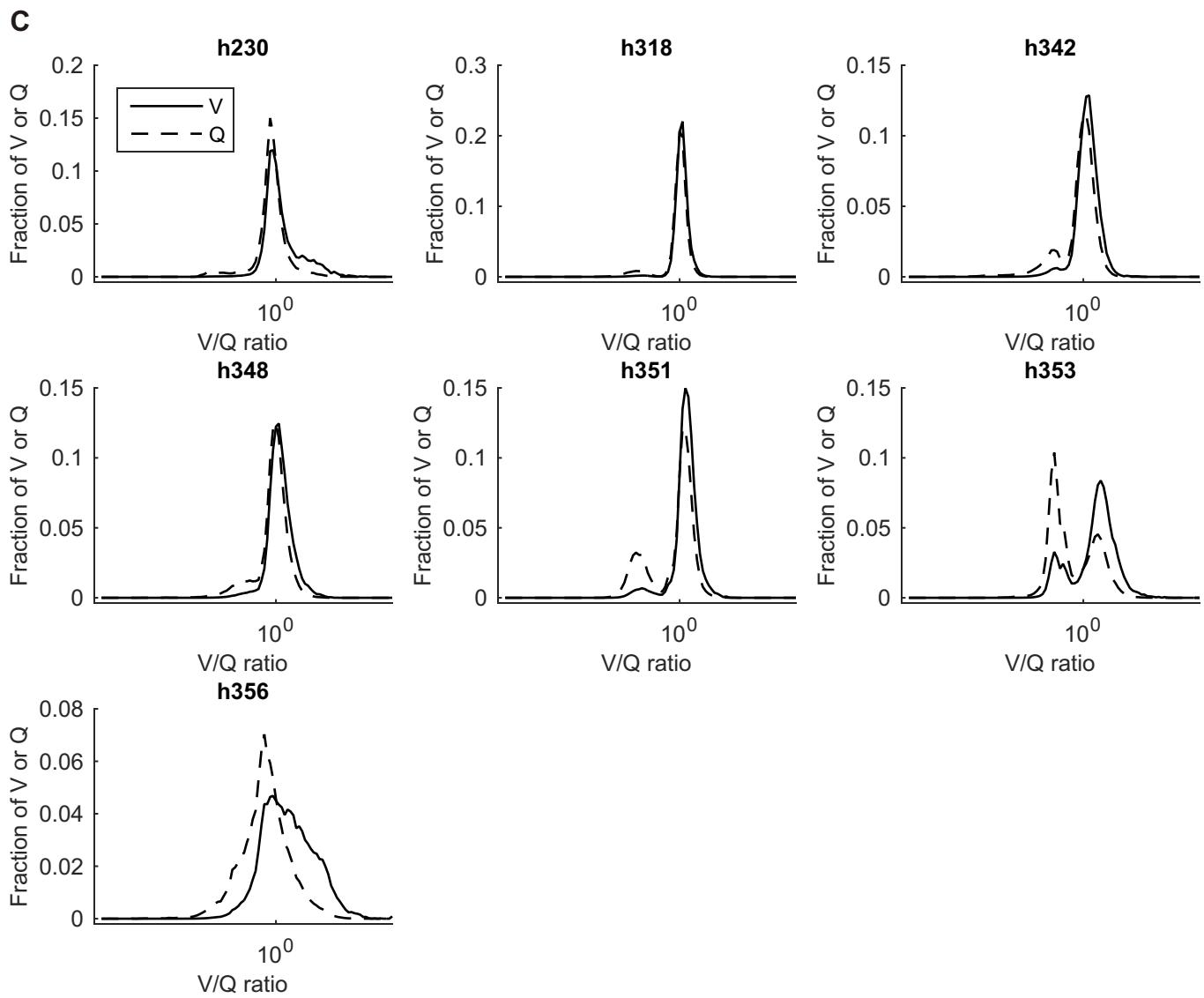


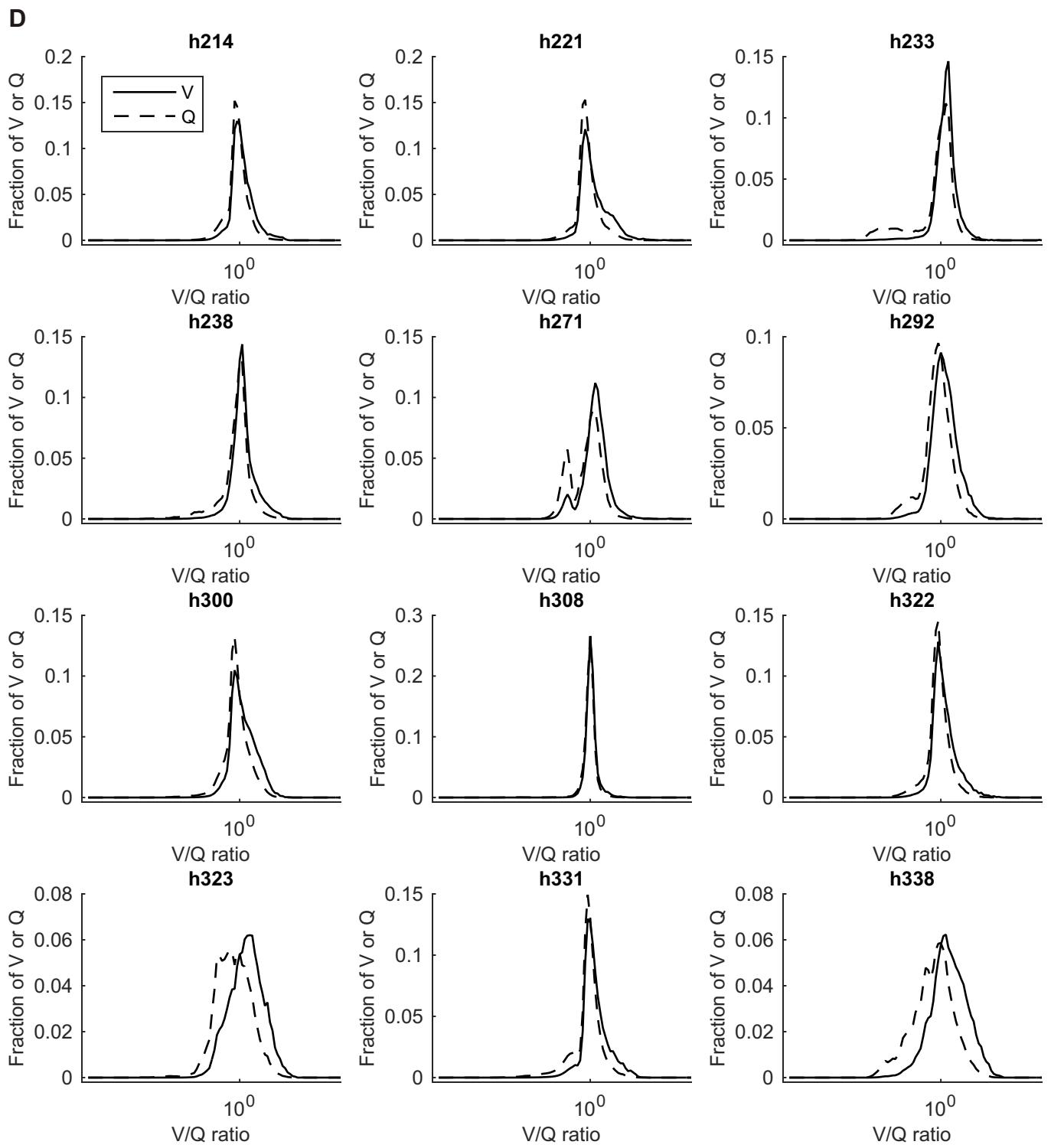
Supplemental Figure E2, Panels A-D

V/Q distributions in all subjects, grouped by HIV and smoking status. **Panel A** includes perfusion height maps for controls, **Panel B** for non-smokers living with HIV, **Panel C** for smokers without HIV and **Panel D** for smokers living with HIV. The distributions of V/Q ratios did not distinguish subjects based on HIV infection or smoking status. The distributions were unimodal in all subjects, except 2 non-smokers living with HIV and 1 smoker who had bimodal distributions.



B





Supplemental Table E1: Regional Ventilation Distribution

Trait	Non-smoker		Smoker		p-value
	HIV-	HIV+	HIV-	HIV+	
F_{tis}	0.30 (0.07)	0.3 (0.03)	0.29 (0.09)	0.33 (0.05)	0.49
F_{tisgrad} (10^{-2}cm^{-1})	0.23 (0.09)	0.26 (0.05)	0.2 (0.08)	0.24 (0.11)	0.52
CV²F_{tis}	0.13 (0.05)	0.13 (0.02)	0.16 (0.07)	0.15 (0.04)	0.61
Volume (ml)	2382 (702)	2441 (681)	3141 (998)	2257 (485)	0.06
Mean sV (10^{-3}s^{-1})	3.29 (1.03)	3.28 (1.57)	3.77 (1.64)	2.79 (0.74)	0.41
sV_{grad} ($10^{-3}\text{s}^{-1}\text{cm}^{-1}$)	-0.86 (0.42)*	-0.71 (0.55)	-0.5 (0.82)	-0.25 (0.77)*	0.09
CV²_{sv}	0.47 (0.29) ^{†‡}	0.71 (0.21) [‡]	0.78 (0.15)* [†]	0.6 (0.15)*	0.01

Continuous variables are represented as mean (SD).

*†‡ indicate p value < 0.05 in with wilcoxon rank sum pairwise testing

Definitions of abbreviations: F_{tis} = tissue fraction; F_{tisgrad} = dorsoventral gradient of the tissue fraction; CV²F_{tis} = squared coefficient of variation quantifying the heterogeneity in fractional tissue content; Volume= gas volume; sV = specific ventilation (V_A/alveolar volume); CV²_{sv} = squared coefficient of variation quantifying heterogeneity in specific ventilation.

Supplemental Table E2: Ventilation – Perfusion Matching

Trait	Non-smoker		Smoker		p-value
	HIV-	HIV+	HIV-	HIV+	
SD Q log (V/Q)	0.25 (0.09)	0.29 (0.06)	0.34 (0.06)	0.29 (0.08)	0.11
SD V log (V/Q)	0.24 (0.09)	0.25 (0.06)	0.27 (0.11)	0.25 (0.06)	0.85

Definitions of abbreviations: SD Q log (V/Q) = dispersion of perfusion on the V/Q scale; SD V log (V/Q) = dispersion of ventilation on the V/Q scale.