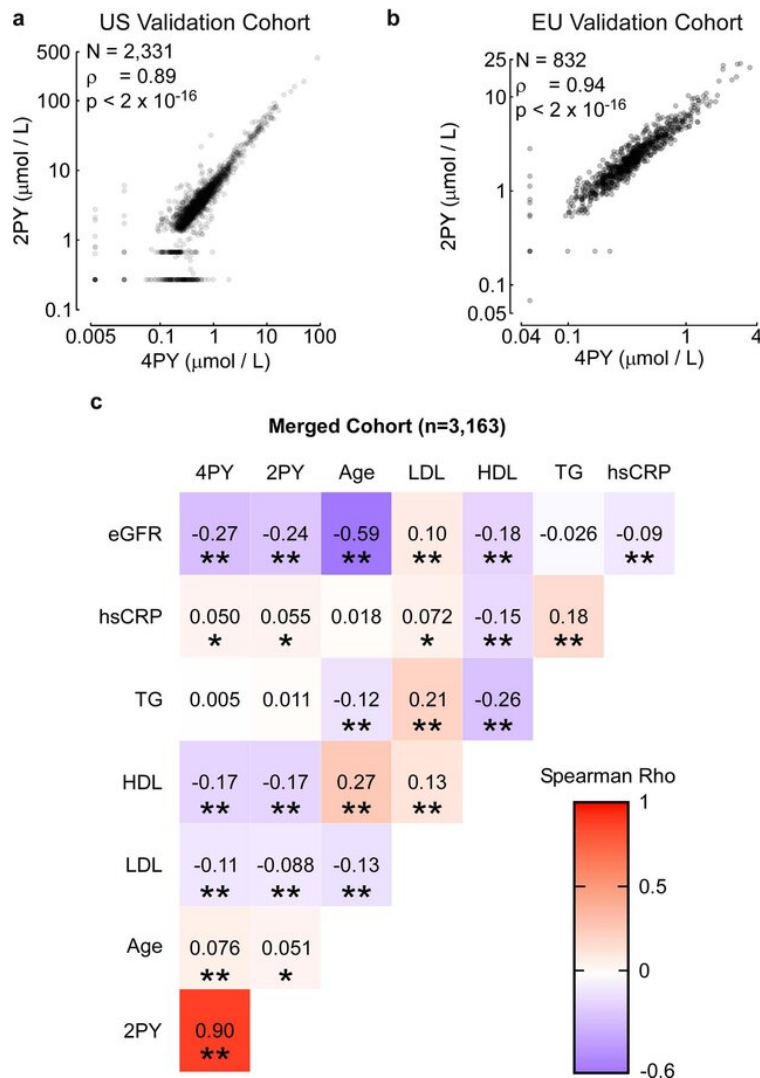


### Figure

**Caption**

Verifying the MACE-associated serum analyte with  $m/z = 153.0656$  Da is comprised of 2PY and 4PY. The MACE-associated serum analyte with  $m/z = 153.0656$  Da was resolved into two chromatographically separable structural isomers, 2PY and 4PY, using the new HPLC method. The two analytes have retention times of 2.4 min (metabolite 1; 2PY) and 3.4 min (metabolite 2; 4PY). (a) High resolution CID spectrum of serum metabolite 1 with retention time 2.4 min compared to synthetic 2PY (retention time 2.4 min). Peaks are labeled with their measured  $m/z$  in Da. (b) Sizes of predicted fragments of 2PY. Predicted fragments are labeled with their predicted  $m/z$  in Da. (c) CID spectrum of metabolite 2 with retention time 3.4 min compared to synthetic 4PY (retention time 3.4 min). Peaks are labeled with their measured  $m/z$  in Da. (d) Sizes of predicted fragments of 4PY. Predicted fragments are labeled with their predicted  $m/z$  in Da. Chemical synthesis of 2PY and 4PY is described in Supplemental Methods, and <sup>1</sup>H-NMR spectra of synthetic material are shown in Supplemental Figs. 1 and 2. Differences in  $m/z$  among predicted fragments and those observed for synthetic and serum 2PY and 4PY were within expected experimental error and are shown in Supplemental Table 6. Source data

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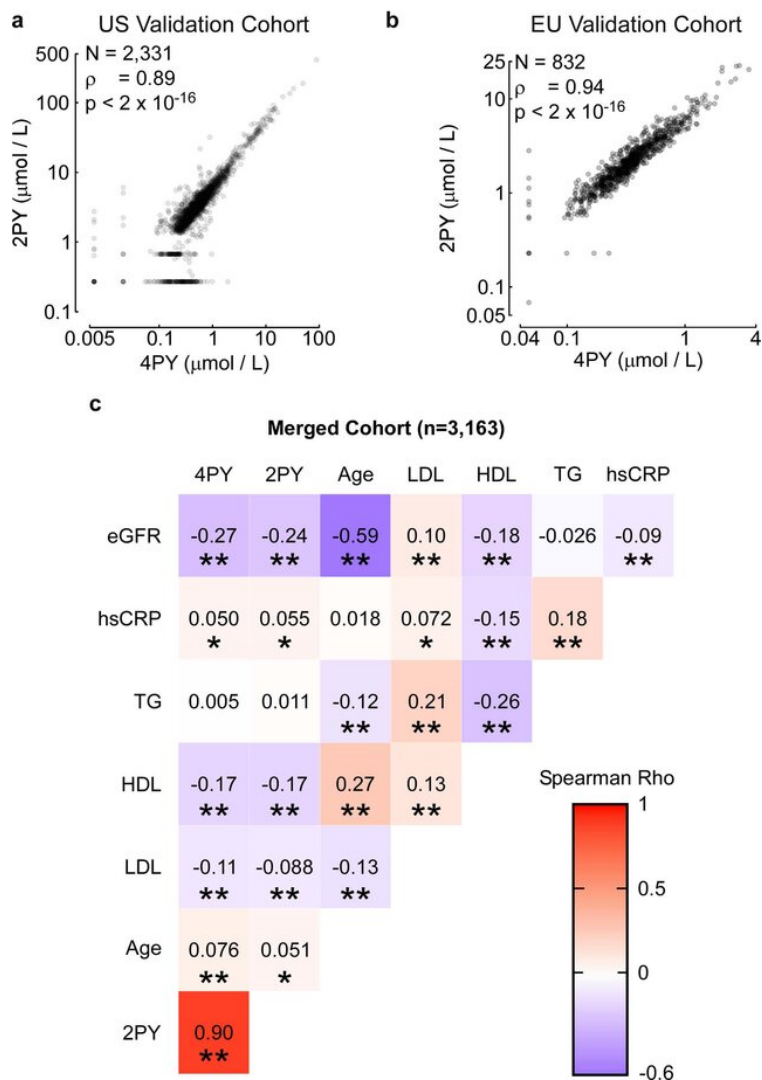


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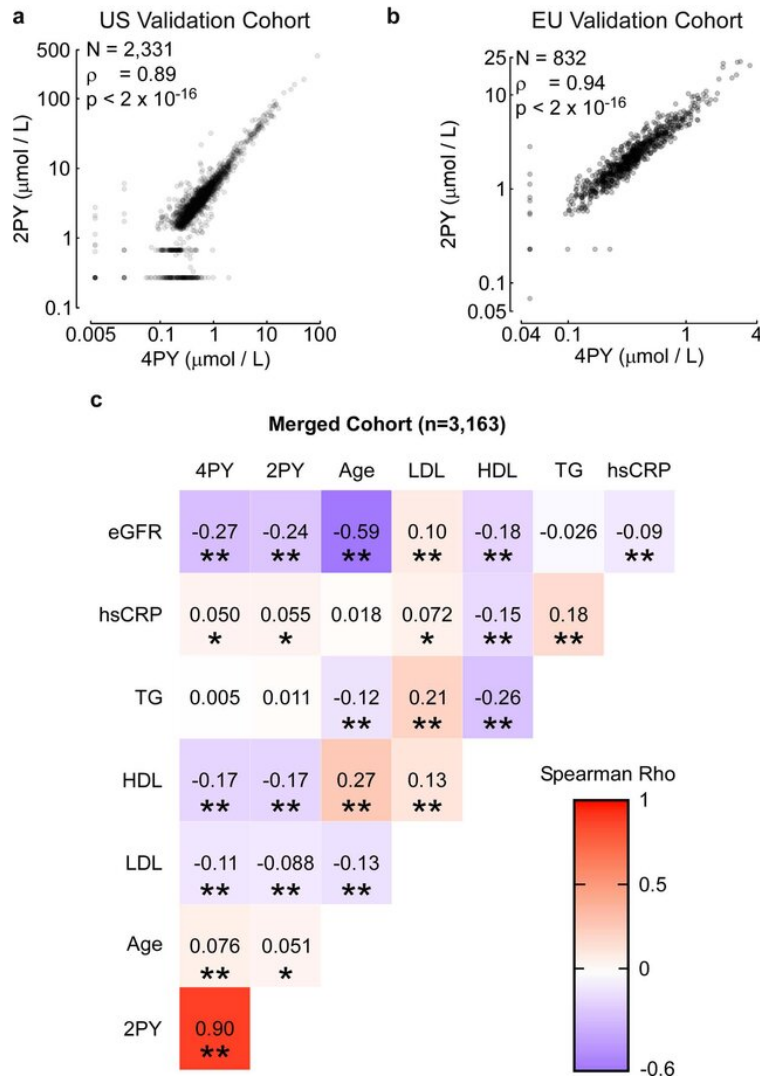


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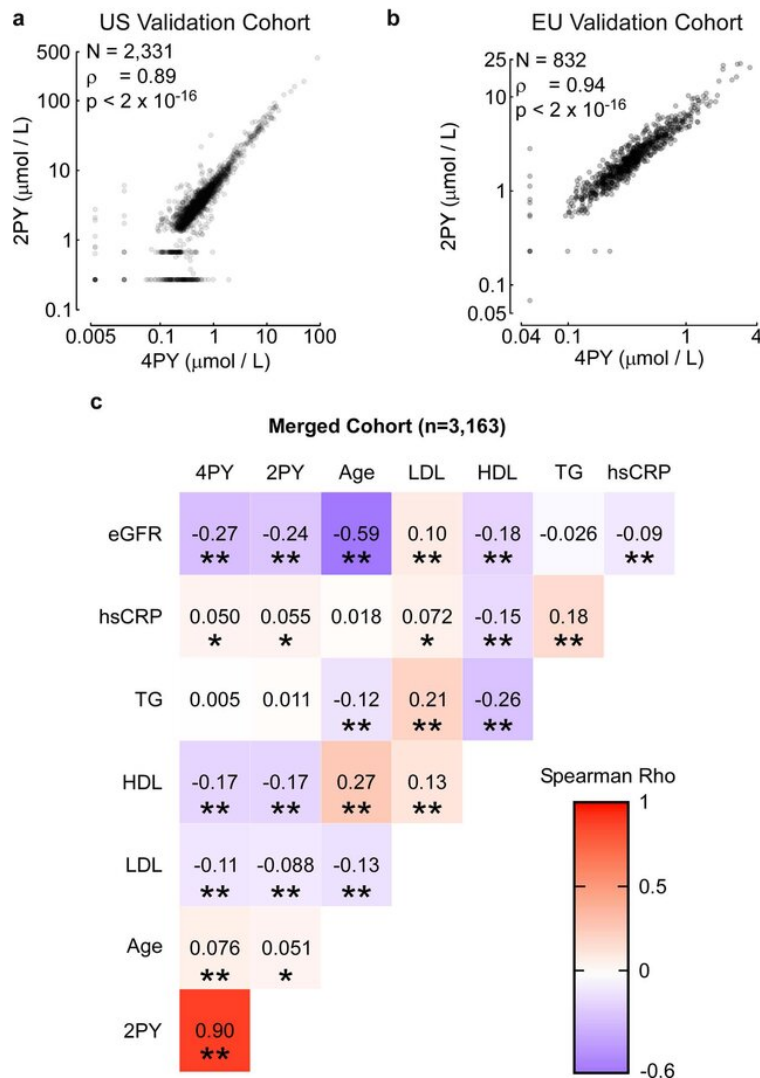


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