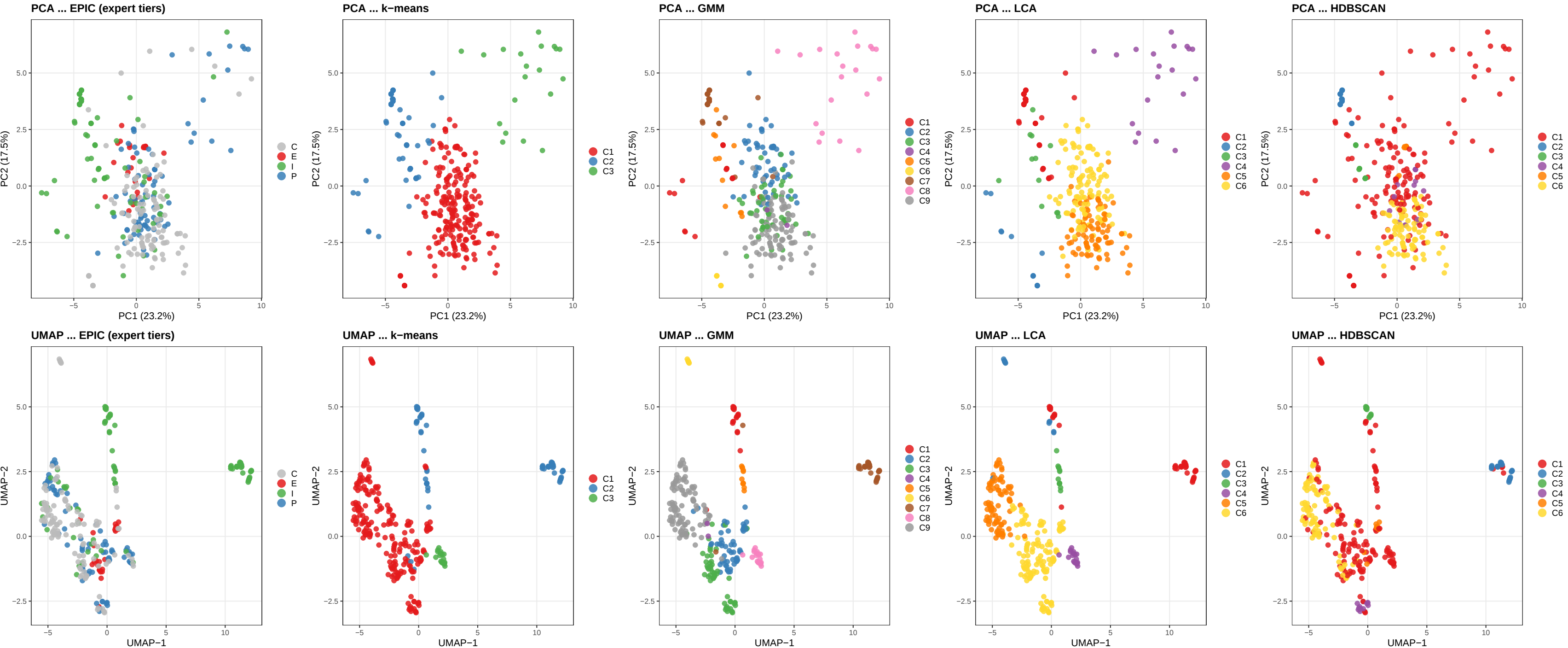


ABM Atlas ... PCA & UMAP projections of 300 ADR associations (34-feature model)

Top: PCA. Bottom: UMAP. Columns: expert EPIC tiers vs four unsupervised classifiers.



ABM Atlas ... cluster names, EPIC overlap and description (v20, 34–feature model)

EPIC: E=Effect P=Predisposition I=Indication C=inConclusive. Overlap = % of each cluster's members falling in each expert EPIC tier.

Method	CI	n	Cluster name	EPIC	EPIC overlap % (E/P/I/C)	Description
KMEANS	C1	220	Heterogeneous / mixed	P	E 11 / P 30 / I 11 / C 48	Mixed tiers (dominant C 48%)
KMEANS	C2	60	Canonical indication	I	E 3 / P 0 / I 92 / C 5	On-label drug–disease pair (confounding by indication)
KMEANS	C3	20	Rare–variant predisposition	P	E 0 / P 65 / I 10 / C 25	Drug–amplified, often rare–variant; partial mechanism
GMM	C1	19	Canonical indication	I	E 0 / P 0 / I 100 / C 0	On-label drug–disease pair (confounding by indication)
GMM	C2	56	Heterogeneous / mixed	P	E 41 / P 29 / I 9 / C 21	Mixed tiers (dominant E 41%)
GMM	C3	53	Predisposition–leaning	P	E 4 / P 43 / I 6 / C 47	Drug–amplified signal, predominantly Predisposition
GMM	C4	2	Inconclusive / weak–evidence	C	E 0 / P 0 / I 0 / C 100	Low signal across all evidence layers (default bucket)
GMM	C5	11	Indication (pleiotropic)	I	E 0 / P 9 / I 73 / C 18	On-label or pleiotropic common–variant indication
GMM	C6	7	Inconclusive / weak–evidence	C	E 0 / P 0 / I 0 / C 100	Low signal across all evidence layers (default bucket)
GMM	C7	31	Canonical indication	I	E 0 / P 0 / I 100 / C 0	On-label drug–disease pair (confounding by indication)
GMM	C8	20	Rare–variant predisposition	P	E 0 / P 65 / I 10 / C 25	Drug–amplified, often rare–variant; partial mechanism
GMM	C9	101	Inconclusive / weak–evidence	P	E 1 / P 26 / I 13 / C 60	Low signal across all evidence layers (default bucket)
LCA	C1	43	Canonical indication	I	E 0 / P 0 / I 98 / C 2	On-label drug–disease pair (confounding by indication)
LCA	C2	13	Heterogeneous / mixed	I	E 0 / P 8 / I 38 / C 54	Mixed tiers (dominant C 54%)
LCA	C3	12	Indication (pleiotropic)	I	E 0 / P 8 / I 75 / C 17	On-label or pleiotropic common–variant indication
LCA	C4	20	Rare–variant predisposition	P	E 0 / P 65 / I 10 / C 25	Drug–amplified, often rare–variant; partial mechanism
LCA	C5	88	Inconclusive / weak–evidence	P	E 0 / P 28 / I 11 / C 60	Low signal across all evidence layers (default bucket)
LCA	C6	124	Heterogeneous / mixed	P	E 21 / P 32 / I 10 / C 37	Mixed tiers (dominant C 37%)
HDBSCAN	C1	148	Heterogeneous / mixed	I	E 10 / P 32 / I 24 / C 34	Mixed tiers (dominant C 34%)
HDBSCAN	C2	25	Canonical indication	I	E 0 / P 0 / I 100 / C 0	On-label drug–disease pair (confounding by indication)
HDBSCAN	C3	12	Canonical indication	I	E 0 / P 0 / I 100 / C 0	On-label drug–disease pair (confounding by indication)
HDBSCAN	C4	14	Rare–variant predisposition	P	E 7 / P 64 / I 0 / C 29	Drug–amplified, often rare–variant; partial mechanism
HDBSCAN	C5	10	Tissue–aligned effector	E	E 80 / P 10 / I 0 / C 10	Full mechanism: all evidence layers + tissue–specific
HDBSCAN	C6	91	Inconclusive / weak–evidence	P	E 2 / P 24 / I 9 / C 65	Low signal across all evidence layers (default bucket)