type	subtype	num	DIANE	Bert	BioBert	PubmedBert	SAPBert
similar pairs	RxNorm Hierachy	650	**0.799**	0.498	0.569	0.601	0.656
	PheCode Hierachy	510	**0.937**	0.638	0.584	0.605	0.830
	LOINC Hierachy	477	0.610	0.910	0.856	0.857	**0.984**
related pairs	Differential Diagnosis	1226	**0.768**	0.590	0.562	0.565	0.725
	May Treat	1133	0.747	0.653	0.616	0.656	**0.761**
	Classifies	751	**0.850**	0.545	0.509	0.545	0.730
	May Prevent	171	**0.802**	0.602	0.578	0.651	0.785

Table 1: AUC of detecting different types of know-relationship pairs.

	DIANE	Bert	BioBert	PubmedBert	SAPBert
AUC	**0.854**	0.770	0.691	0.740	0.770
Brier score	**0.049**	0.069	0.073	0.072	0.067

Table 2: The risk prediction performance of decision trees.

(a) top features of patients with AD

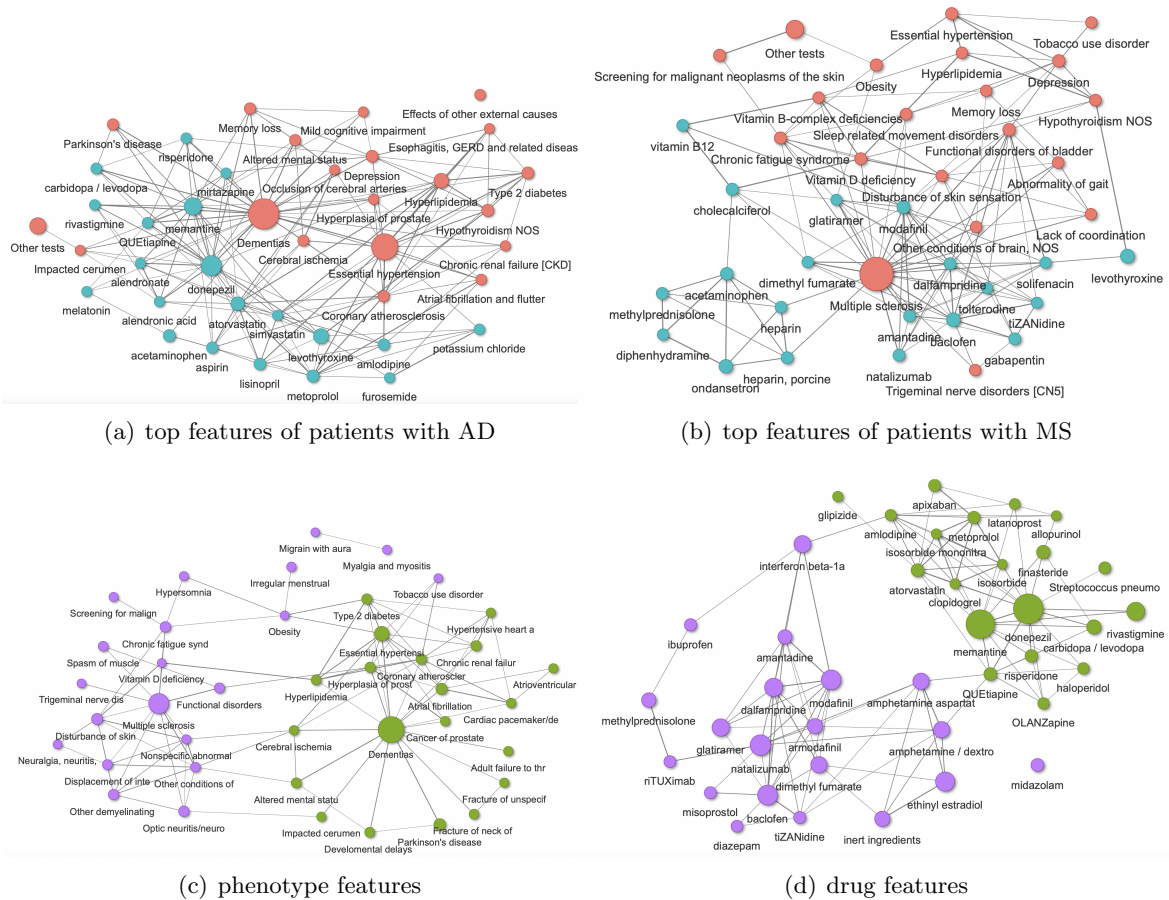(b) top features of patients with MS

(c) phenotype features

(d) drug features

Figure 1: The feature networks for AD and MS patients in UPMC cohort.