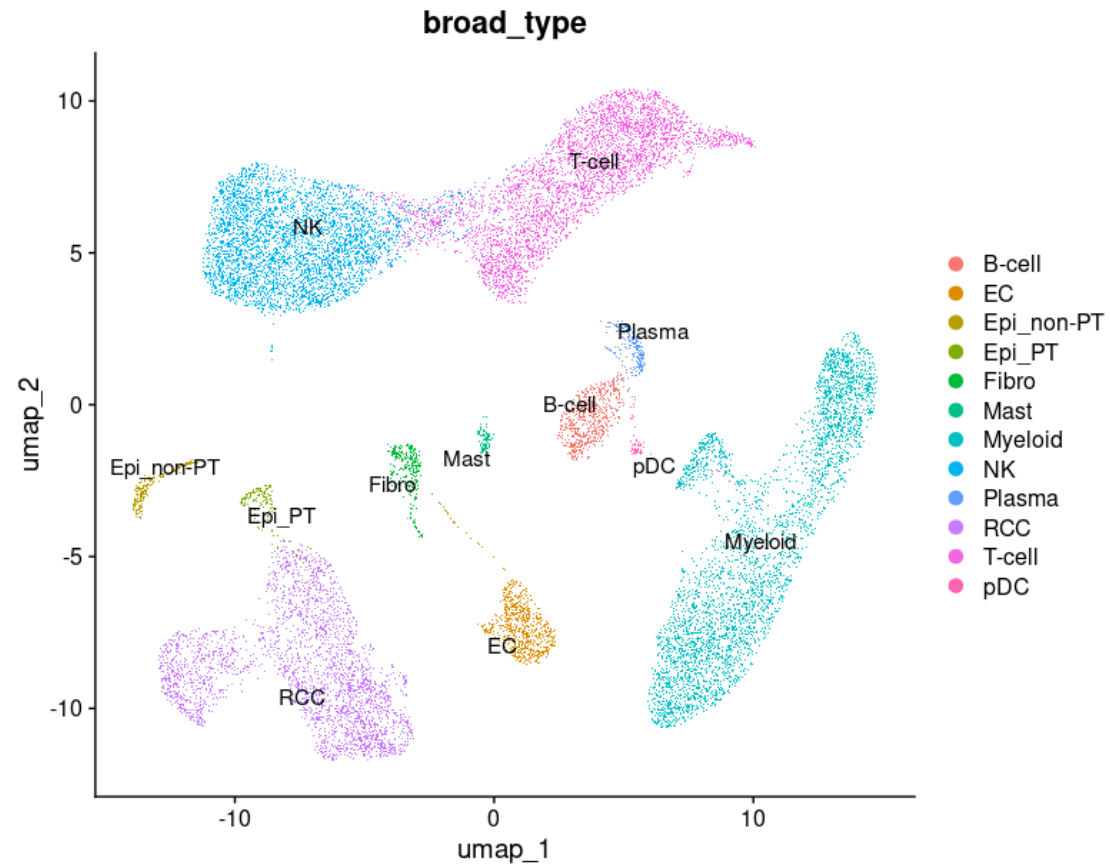


Clinicopathological info of kidney patients

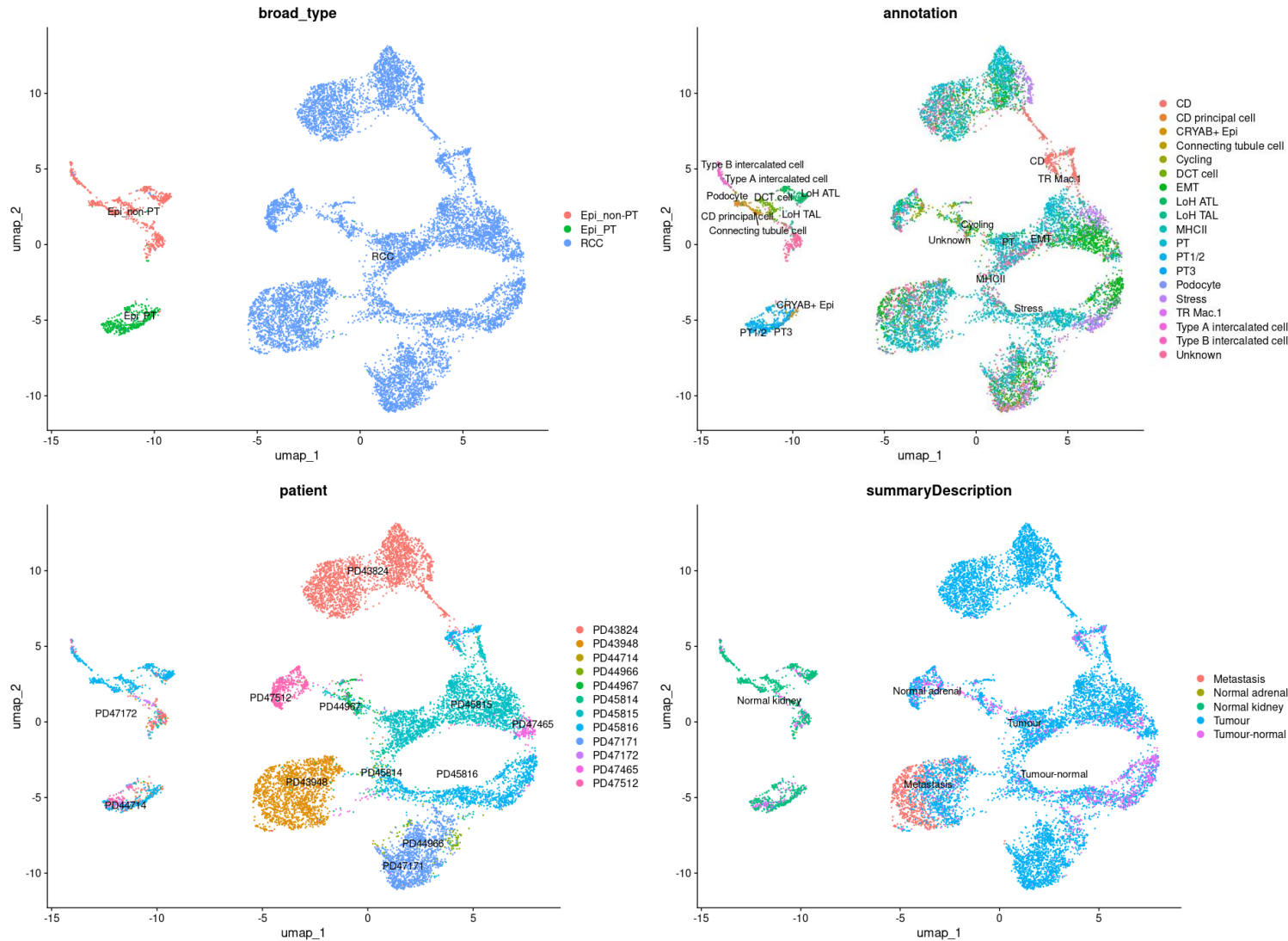
Patient_ID	sex	age	stage	metastases	grade	necrosis	sarcomatoid changes	lymphovascular invasion	Leibovich	Histology	VHL	PBRM1	BAP1	SETD2	TSC2	KDM5C
PD43824	male	41-50	1b	0	2	no	no	no	2	ccRCC	ns-sub					
PD43948	female	71-80	3a	1	4	yes	yes	yes	8	ccRCC					bifs	
PD44714	male	51-60	NA	0	NA				NA	Benign						
PD44966	male	51-60	1a	0	3	no	no	no	1	ccRCC	fs		fs			
PD44967	male	71-80	NA	1	4	no	no	no	8	ccRCC	-	-	-	-	-	-
PD45814	male	61-70	3a	0	4	yes	yes	yes	8	ccRCC	fs	fs				
PD45815	male	51-60	3a	0	2	no	no	no	4	ccRCC	fs					
PD45816	female	71-80	3a	0	4	yes	yes	yes	9	ccRCC			ns-sub			
PD47171	female	51-60	3a	0	4	yes	yes	yes	7	ccRCC	ns-sub	fs	ns-sub			
PD47172	male	51-60	NA	0	NA				NA	oncocytoma						
PD47465	female	61-70	3a	0	3	no	no	yes	5	ccRCC	ns-sub	fs		fs		ns-sub
PD47512	male	51-60	3a	0	4	yes	yes	yes	8	ccRCC	fs	ns-sub		ns-sub		

Malfunction of **VHL**, a crucial driver of ccRCC, leads to accumulation HIF-2α
TSC2 frameshift mutation leads to loss of mTOR pathway suppression

Identification of human ccRCC cell populations



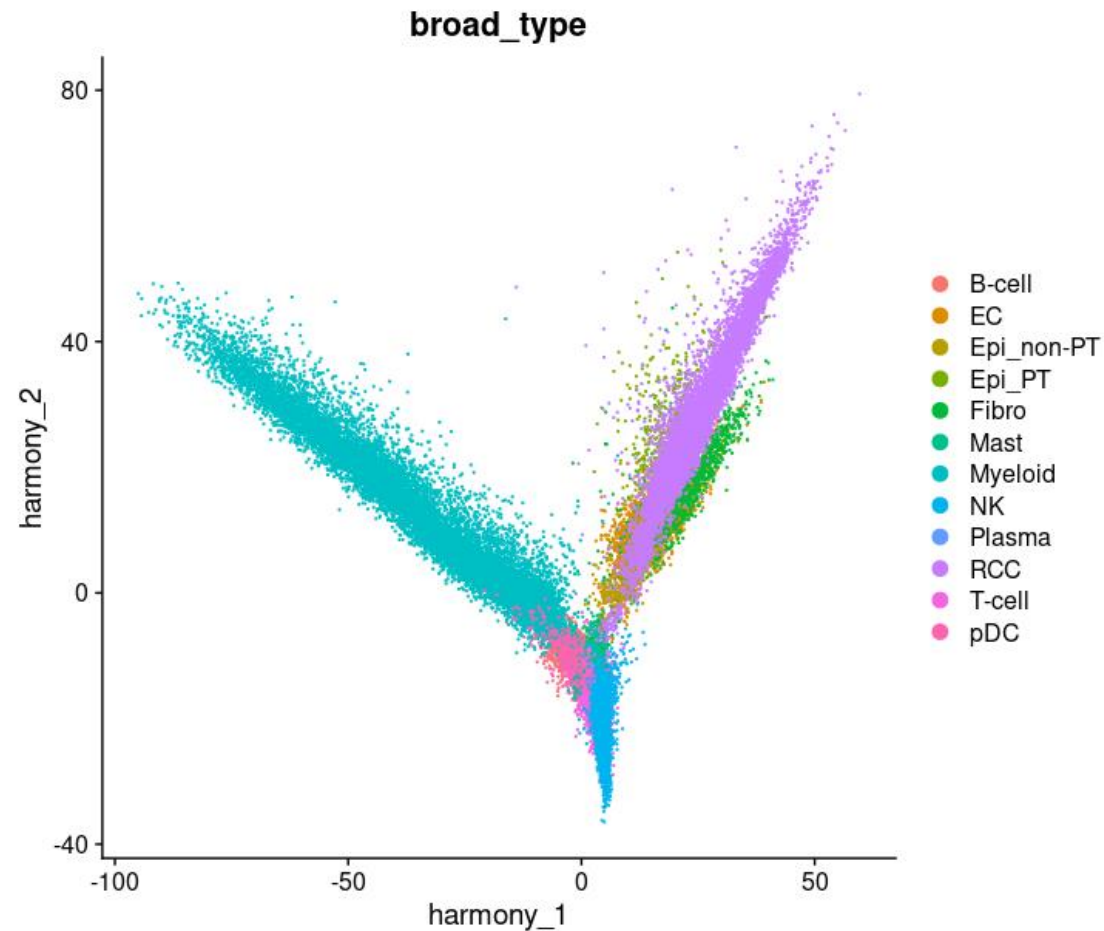
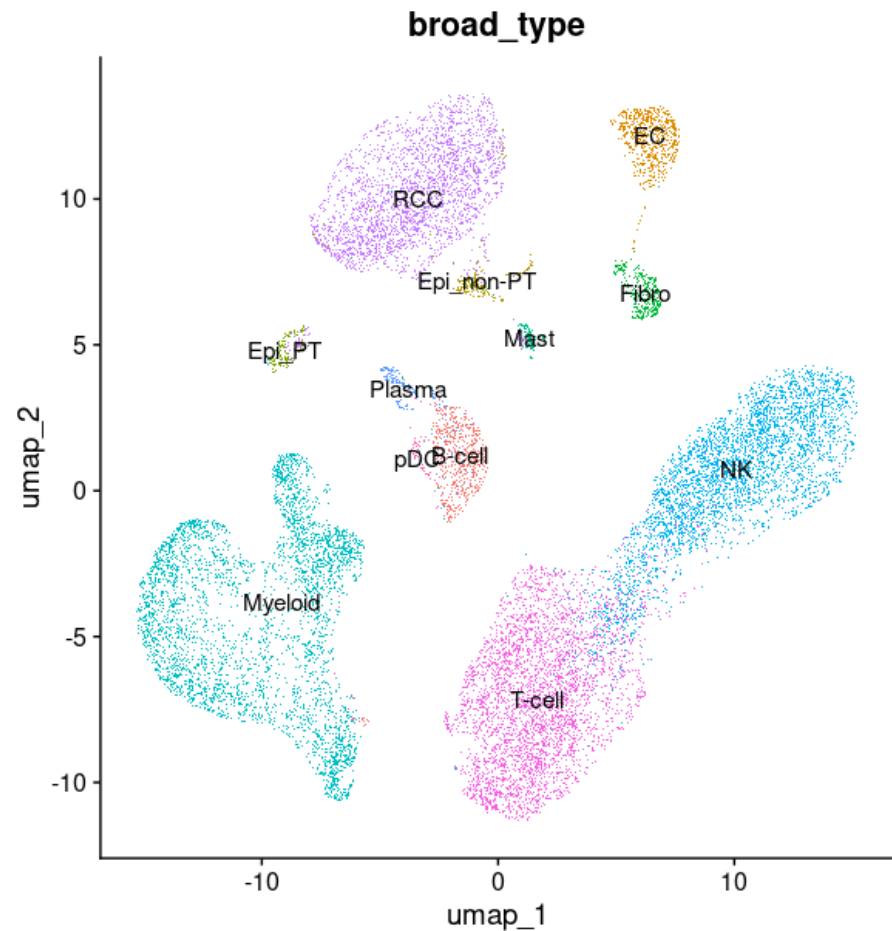
Epithelial cells of RCC



✓ Clusters unique to a donor through heterogeneity can bias the pseudo-time trajectory

→ Harmonization is needed

After harmonization



Cancer-Epithelial cells (RCC, Epi_PT, Epi_non-PT, Fibro, EC) & Immune cells (Myeloid, NK, T-cell) are separated clearly

After harmonization

