

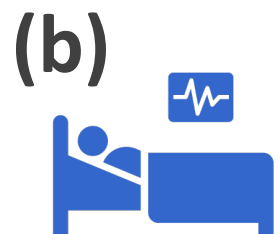
Patient 1

Gene	Mutation	Codons
	C→T	aCt→aTt
	C→T	Cag→Tag



Patient 2

Gene	Mutation	Codons
	G→A	cGa→cAa
	C→T	aCg→aTg
	A→T	Aca→Tca
	T→A	Tgg→Agg



Patient 1

Mutational Profile		
	C→T	aCt→aTt
	C→T	Cag→Tag.



Patient 2

Mutational Profile		
	G→A	cGa→cAa
	C→T	aCg→aTg
	A→T	Aca→Tca
	T→A	Tgg→Agg.

IPMNs  
*N* samples



MSK  
2020

(c)

PADs  
*M* samples



MSKCC  
2017



Positive  
Pairs

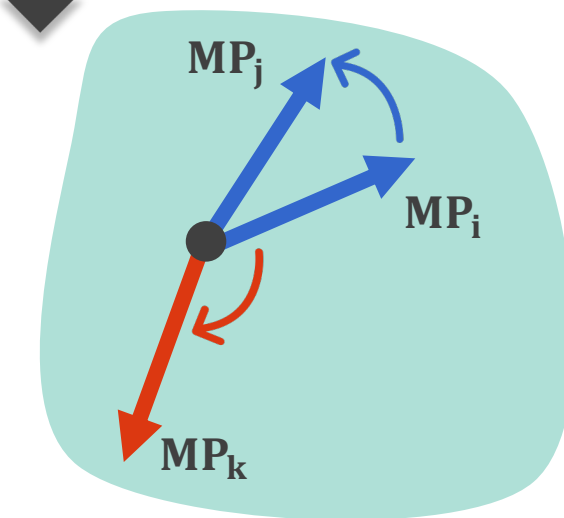
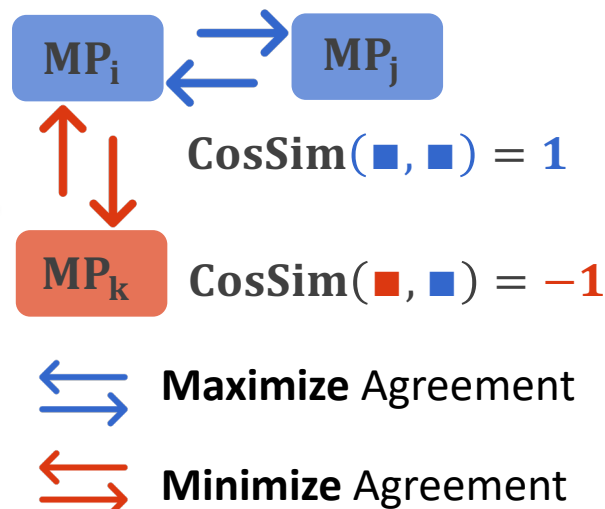
MP <sub>1</sub>	MP <sub>1</sub>
MP <sub>1</sub>	MP <sub>2</sub>
...	...
MP <sub>N</sub>	MP <sub>N-1</sub>
MP <sub>N</sub>	MP <sub>N</sub>



Negative  
Pairs

MP <sub>1</sub>	MP <sub>1</sub>
MP <sub>1</sub>	MP <sub>2</sub>
...	...
MP <sub>N</sub>	MP <sub>M-1</sub>
MP <sub>N</sub>	MP <sub>M</sub>

Contrastive Learning



Embedding Space