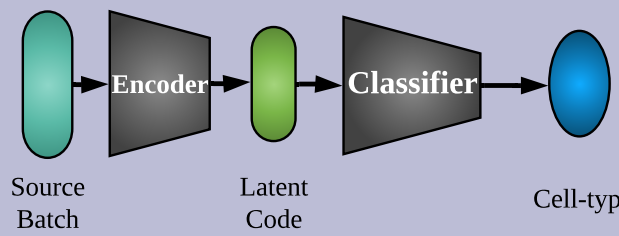
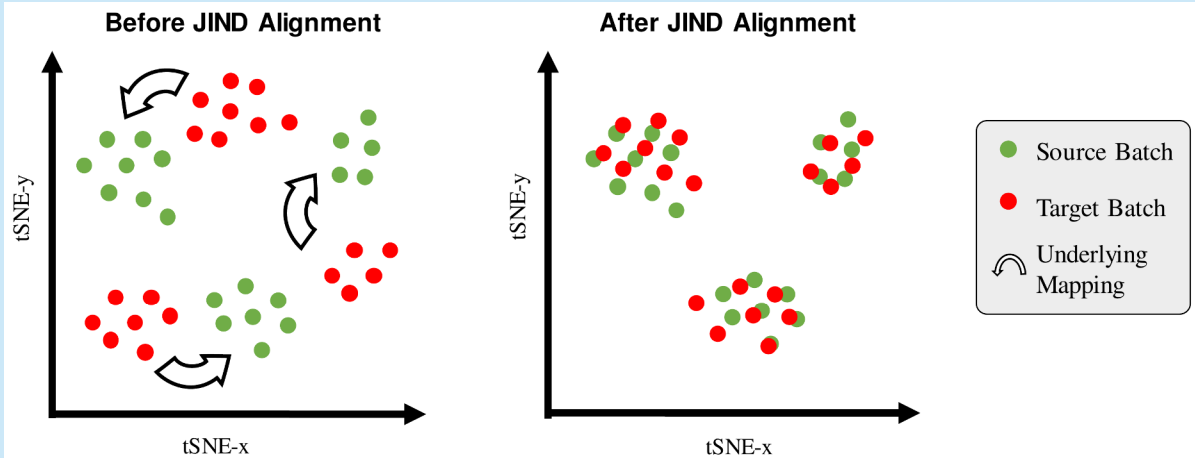
Cell	Genes			Cell-type
	Gene 1		Gene *M*	
#1	1	..	2	alpha
..	..	..	..	..
$\#N_s$	0	..	3	gamma

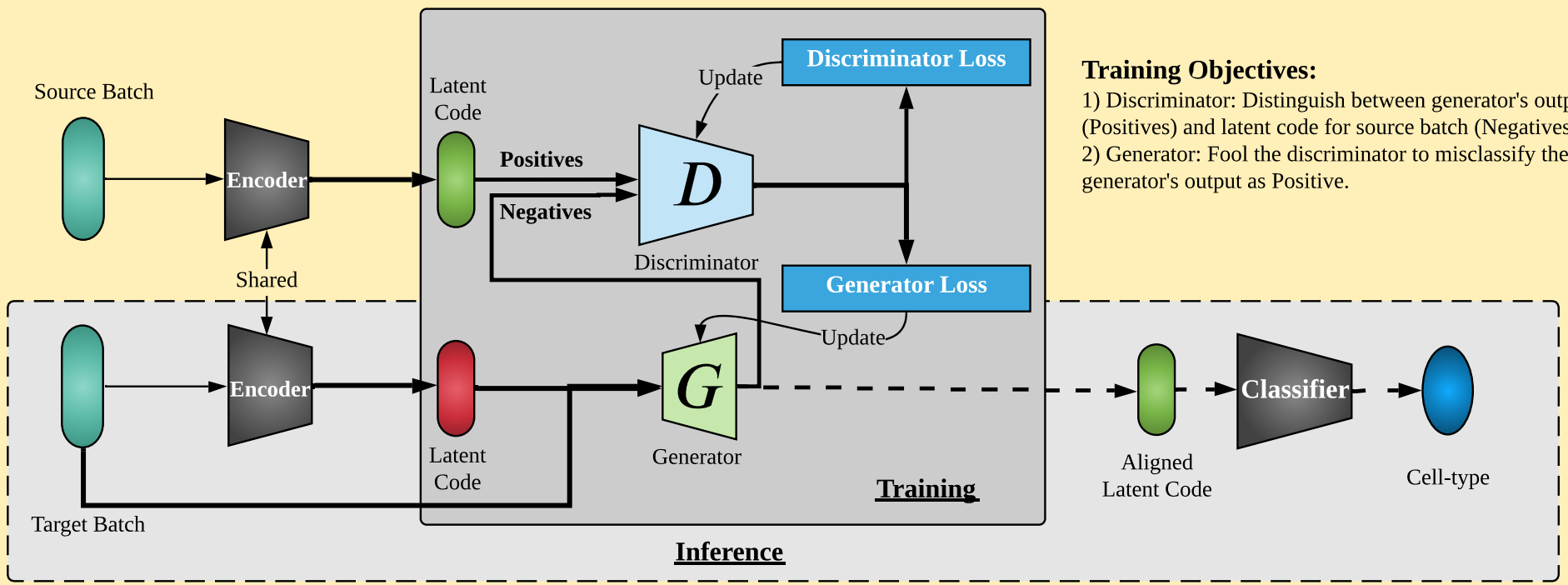
a1) Source batch with cell-type annotations



a2) Prediction model consisiting of encoder and classifier jointly trained on source batch



b) Illustration demonstrating the JIND batch alignment in the latent space learnt by the classifier. JIND learns the underlying mapping between the source batch and the target batch clusters in an unsupervised manner (without any knowledge of cell-types in the target batch)



Training Objectives:
1) Discriminator: Distinguish between generator's output (Positives) and latent code for source batch (Negatives).
2) Generator: Fool the discriminator to misclassify the generator's output as Positive.

c) JIND Batch Alignment; 1) Training: Discriminator and Generator are learned to minimise and maximise the classification loss respectively; 2) Inference: Target batch uses the encoder and the generator to obtain the aligned latent code which is used by the classifier to predict the cell-type.