



JIND-Multi workflow. **Top:** A neural network (NN) based encoder and cell-type classifier are trained on the source dataset (colored blue). This step creates a latent space (green) suitable for cell type classification and fixes the encoder and classifier for the remaining steps (colored grey). **Middle:** For each additional annotated dataset, the encoder generates a latent space with batch effect (red). To remove this noise, a NN-based generator is trained for each dataset to generate a latent space (green) that can be correctly classified by the already trained classifier, and hence that is aligned to that of the source's. This step increases the number of samples that can be used to train the Generative Adversarial Network (GAN) of the next step. **Bottom:** To annotate the unlabeled dataset (target), a GAN is trained such that the generator produces a latent space indistinguishable from that of the sources' and that can be used as input to the trained classifier.