Supplementary materials

1. Implementation details

All experiments were implemented using MONAI[1] framework. The models were trained on a slurm cluster with NVIDIA GeForce RTX 3090 GPUs with the batch size of 1 and gradient accumulation for 8 steps, using the Adam optimizer with initial learning rate of 0.001 for 25,000 iterations. The only augmentation was flip with probability 0.5. During training tiles of size $192 \times 192 \times 192$ were sampled from the volumes randomly. Dice loss averaged over channels was used for training. Dice is not defined when the label has no non-zero pixels, therefore for tiles with empty channels the empty channels were not used in averaging.

U-Net with two downsampling steps and 32, 64 and 128 feature maps in the first, second and bottleneck levels was used. For all normalization layers that use running average to collect statistics `momentum` was set to 0.01.

UNETR encoder had $16 \times 16 \times 16$ patch size, 12 attention heads and hidden embedding size 768. Convolutional patch projection and trainable positional embedding were used, following the recommendations in the UNETR paper.

For the Batch Renormalization layer (adapted from https://github.com/ludvb/batchrenorm) we set $r_{max} = 3$, $d_{max} = 5$ following the original paper. The models were trained for 1000 steps for embryo and organoids datasets and 5000 steps for plants dataset with $r = 1$ and $d = 0$, then the parameters were linearly increased to r_{max} and d_{max} over 1000 steps.

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[1] https://monai.io

Table 1. U-Net transfer between plants and embryo datasets. Values in gray correspond to the non-transfer experiments.

Normalization layer		BatchNorm		BatchNorm		InstanceNorm		InstanceNorm		BatchRenorm		Identity	
Input norm		global		tile-wise		global		tile-wise		global		global	
Feature norm		global		global		tile-wise		tile-wise		global		global	
Source / Target		plant	embryo	plant	embryo	plant	embryo	plant	embryo	plant	embryo	plant	embryo
dice, eval mode — plants	foreground	0.85	0.36	0.88	0.42	0.89	0.50	0.89	**0.53**	0.89	0.50	0.52	0.21
	boundaries	0.69	0.11	0.73	0.14	0.75	0.27	0.74	0.22	0.74	**0.29**	0.26	0.25
dice, eval mode — embryo	foreground	0.51	0.66	0.51	0.68	0.54	0.67	0.54	0.72	**0.59**	0.74	0.45	0.59
	boundaries	0.18	0.55	0.14	0.55	0.28	0.55	0.28	0.53	**0.29**	0.58	0.12	0.44
tile mism.	plants	**no**	**no**	0.01	0.00	0.05	0.10	0.05	0.07	**no**	**no**	**no**	**no**
	embryo	**no**	**no**	0.17	0.09	0.18	0.16	0.25	0.20	**no**	**no**	**no**	**no**