

	Protein	Time window	Number of Images	Total number of sampled pixels
01	Blank (no protein)	N/A	24	2400000
02	Endobrevin (0111)	overnight	10	10000
		24h	12	10000
		48h	10	10000
		72h	5	10000
03	GalNacT (0110)	overnight	9	3224
		24h	12	10000
		48h	10	2340
		72h	5	10000
04	GFP (0100)	overnight	10	10000
		24h	12	10000
		48h	5	10000
		72h	5	10000
05	KDEL (1110)	overnight	5	10000
		24h	12	10000
		48h	10	10000
		72h	5	10000
06	Lifeact (1001)	overnight	5	10000
		24h	12	10000
		48h	10	10000
		72h	5	10000
07	NLS (1101)	overnight	10	10000
		24h	12	10000
		48h	10	10000
		72h	5	10000
08	SNAP25 (1100)	overnight	5	5412
		24h	12	10000
		48h	10	10000
		72h	5	10000
09	STX4 (0010)	overnight	10	10000
		24h	12	10000

		48h	10	10000
		72h	5	10000
10	STX6 (0011)	overnight	10	10000
		24h	12	10000
		48h	11	10000
		72h	5	10000
11	TOM70 (1000)	overnight	9	10000
		24h	7	10000
		48h	10	10000
		72h	5	1000
12	Vti1a (1000)	overnight	9	1033
		24h	12	10000
		48h	10	10000
		72h	5	3825

Supplementary Table 3. Summary of the image data used for training and testing the deep network.

Number of confocal images obtained for each protein (with the given nanobarcode) as well as number of pixels that have been sampled for the deep learning dataset. All images have the same dimensions of 512x512 pixels. With 72 h samples, each image contains 5 slices in a z-stack. Network training, validation, and testing are done only based on the sub-sampled pixels (with the numbers given in the last column), while the precision matrices in Supplementary Fig 20 are obtained on full-frame images.