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Supplementary Materials

Co-Density Distribution Maps for Advanced Molecule Colocalization and Co-Distribution Analysis

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Table S1. Comparison between SYP and VGLUT1 intensity and local density colocalization analysis, before and after refinement for local co-density.

	SYP-VGLUT1		
	co-occurrence region (n*=9343)		**co-density region (n*=2394)**
	intensity	**density**	**intensity**
ϱ	0.2406	0.0773	0.4824
ϱ_s	0.1286	0.0953	0.4635
MOC	0.2420	0.2325	0.9317
M_1	0.1386	0.1354	0.0411
M_2	0.4574	0.4530	0.1479

* n: sample size, or number of considered co-occurring pixels.

Figure S1A. Scatterplots of co-occurrence region partitioning by equi-density.

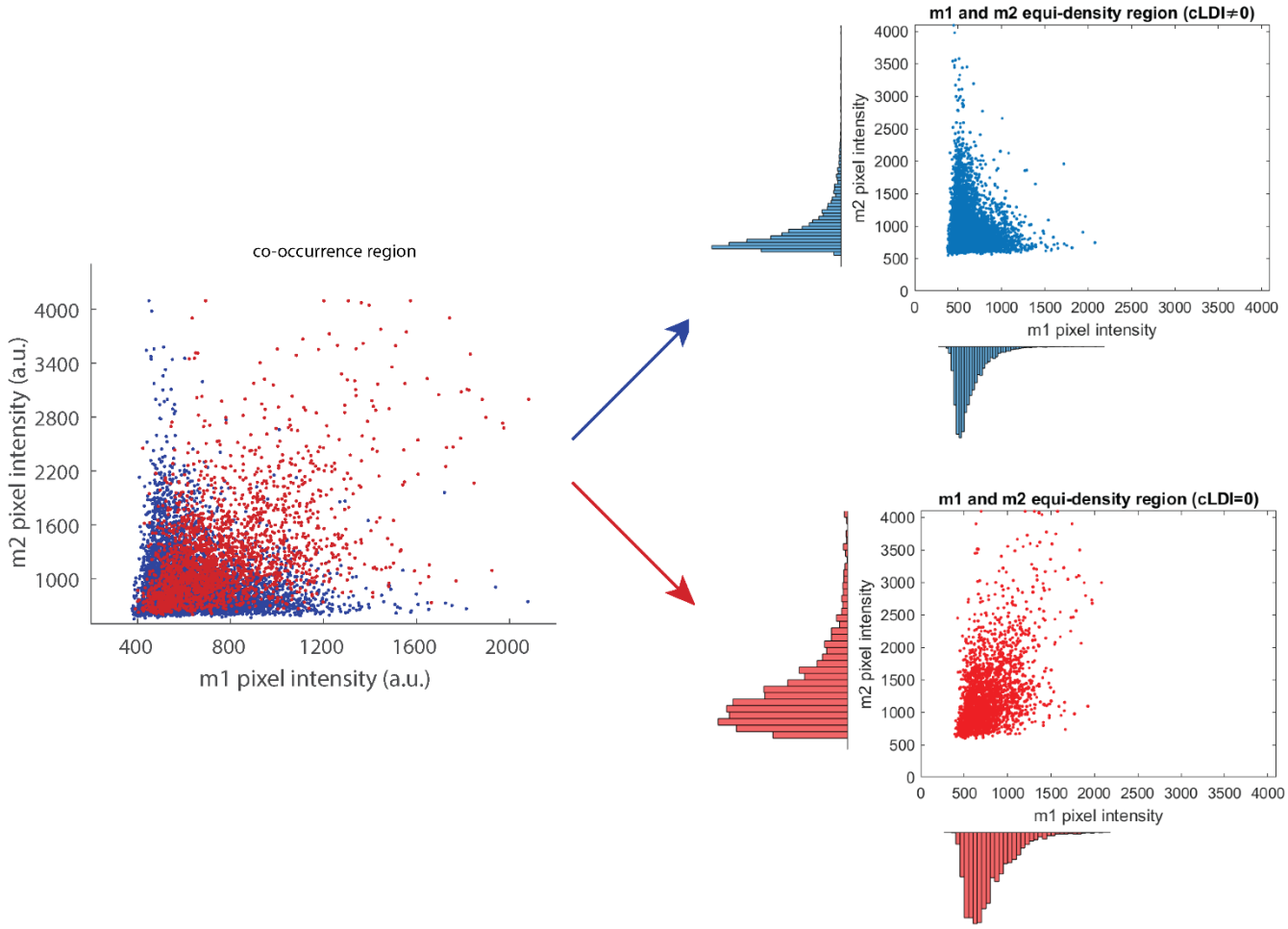

Figure S1B. Scatterplots of co-occurrence region partitioning by cLDI sign.

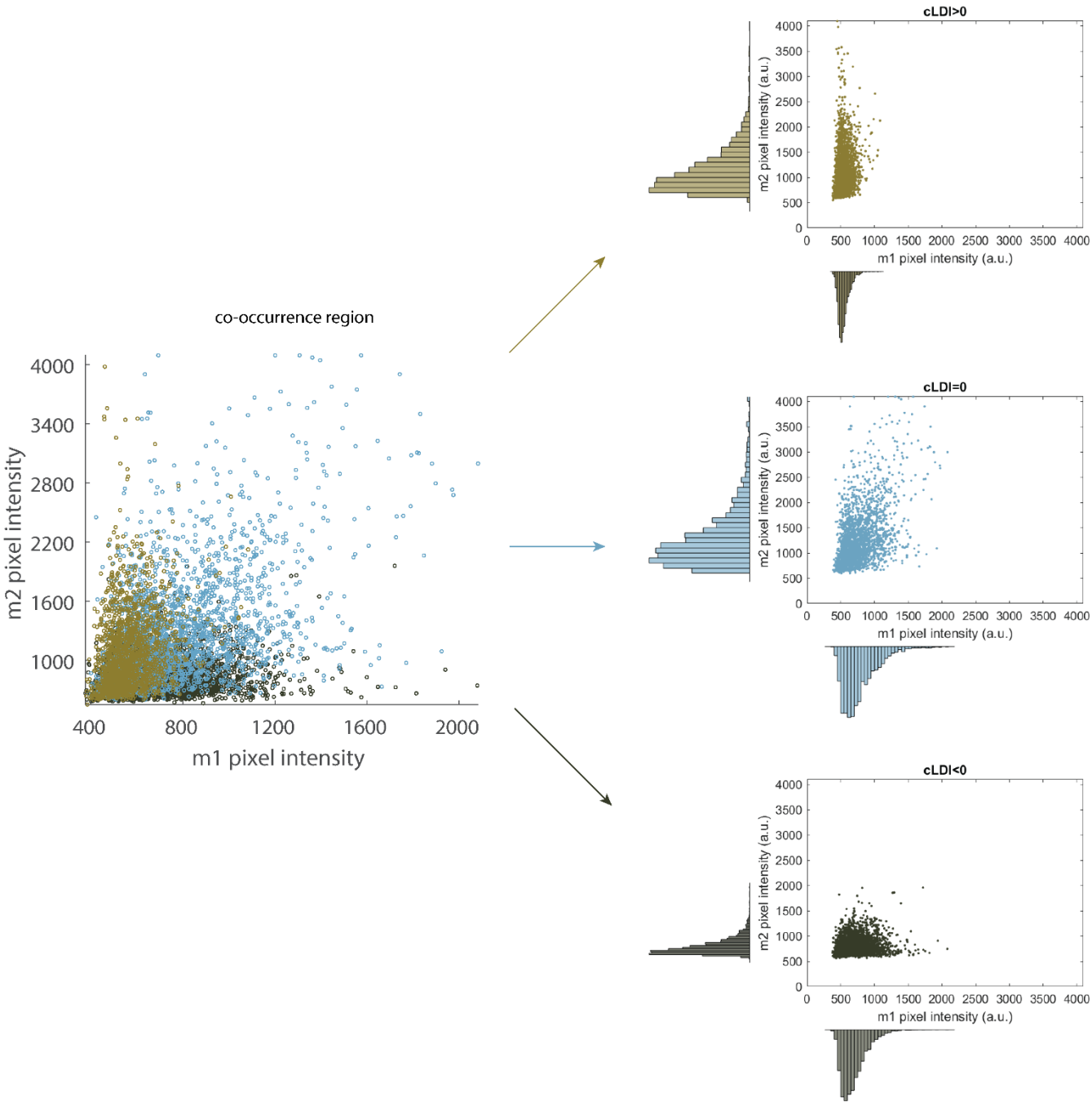

Figure S1C. Scatterplots of co-occurrence region partitioning by cLDI value.

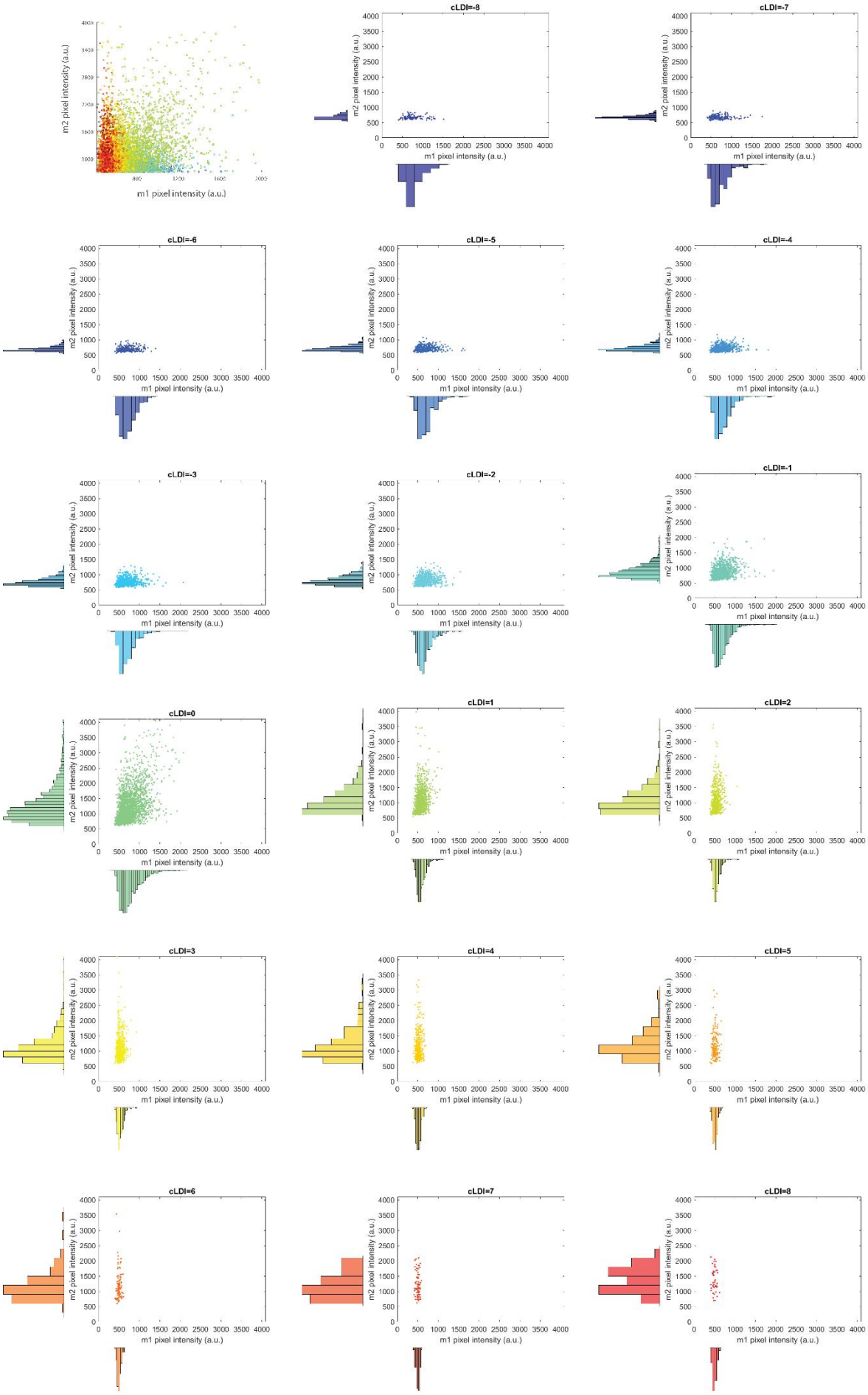
m2 pixel intensity (a.u.)
m1 pixel intensity (a.u.)
cLDI=-8
cLDI=-7
cLDI=-6
cLDI=-5
cLDI=-4
cLDI=-3
cLDI=-2
cLDI=-1
cLDI=0
cLDI=1
cLDI=2
cLDI=3
cLDI=4
cLDI=5
cLDI=6
cLDI=7
cLDI=8

Table S2. *coDDMaker* time performance evaluation.

Image size	Background correction	Locality size (image segmentation)[1]	Search window size (density analysis)	Elapsed Time[2]
1024×1024	No	Global	3×3	20′′
512×512	No	Global	3×3	15′′
512×512	Yes	Global	3×3	20′′
512×512	Yes	3×3	3×3	50′′
512×512	Yes	15×15	3×3	1′20′′
512×512	Yes	15×15	9×9	1′25′′

[1]Otsu thresholding method. [2]Local density and co-density analysis in a couple images on a PC endowed with Intel i3-4005U, 1.70 GHz processor, and 8 GB RAM.

Table S3. Abbreviations.

BW	Black and White image (binary mask)
cDDM	Co-Density Distribution Map
cLDI	Local co-Density Index
cOM	Co-Occurrence Map
DDM	Density Distribution Map
DMS	Dorsal Median Sulcus
FG	Foreground
FM	Fluoromyelin®
GUI	Graphical User Interface
HPL	Helix Pomatia Lectin
IF	Immunofluorescence
Lamp-1	Lysosomal-Associated Membrane Protein 1
LDI	Local Density Index
M1	Mander's coefficient 1
M2	Mander's coefficient 2
MOC	Manders' Overlap Coefficient
NF	Neurofilament
PTX	Paclitaxel
SYP	Synaptophysin
VGLUT1	Vesicular Glutamate Transporter 1
WS	(Search) Window Size
ϱ	Pearson's correlation coefficient (also r, or PCC)
ϱ_s	Spearman's correlation coefficient (also r_s, or SRCC)