Suppl. Figure legends:

Figure S1: Representative images of H&E stained sections from wt, *Bim*- or *Bmf*-deficient mammary glands on day 0 or day 4 of involution, converted into 8 bit images, used for quantification by ImageJ-Fiji and shown in Fig. 3b. Dark purple staining represents epithelium.

Figure S2: STAT5 binds to the 3' exons of the *Bim* and *Bmf* genes. Genome browser snapshots of ChIP-seq data demonstrate binding of STAT5A to specific GAS sites in the *Bim*, *Bmf*, and Bid genes. H3K4me3 ChIP-seq was used to identify the 5' end of the respective genes. For visualization, background signals of less than 2 were eliminated. For Bim and Bmf gene regions including 5 kbp of upstream sequences and 2kbp 3' flanking sequences are shown. STAT5A binds to sites in the 3' untranslated exon of the *Bcl2l11 (Bim) and Bmf* gene. The *Bid* shown includes 13kb of upstream and 2kb of downstream sequences. STAT5A binds to a GAS motif located approximately 12kb upstream of the transcriptional start site but is unlikely of physiological relevance [1].

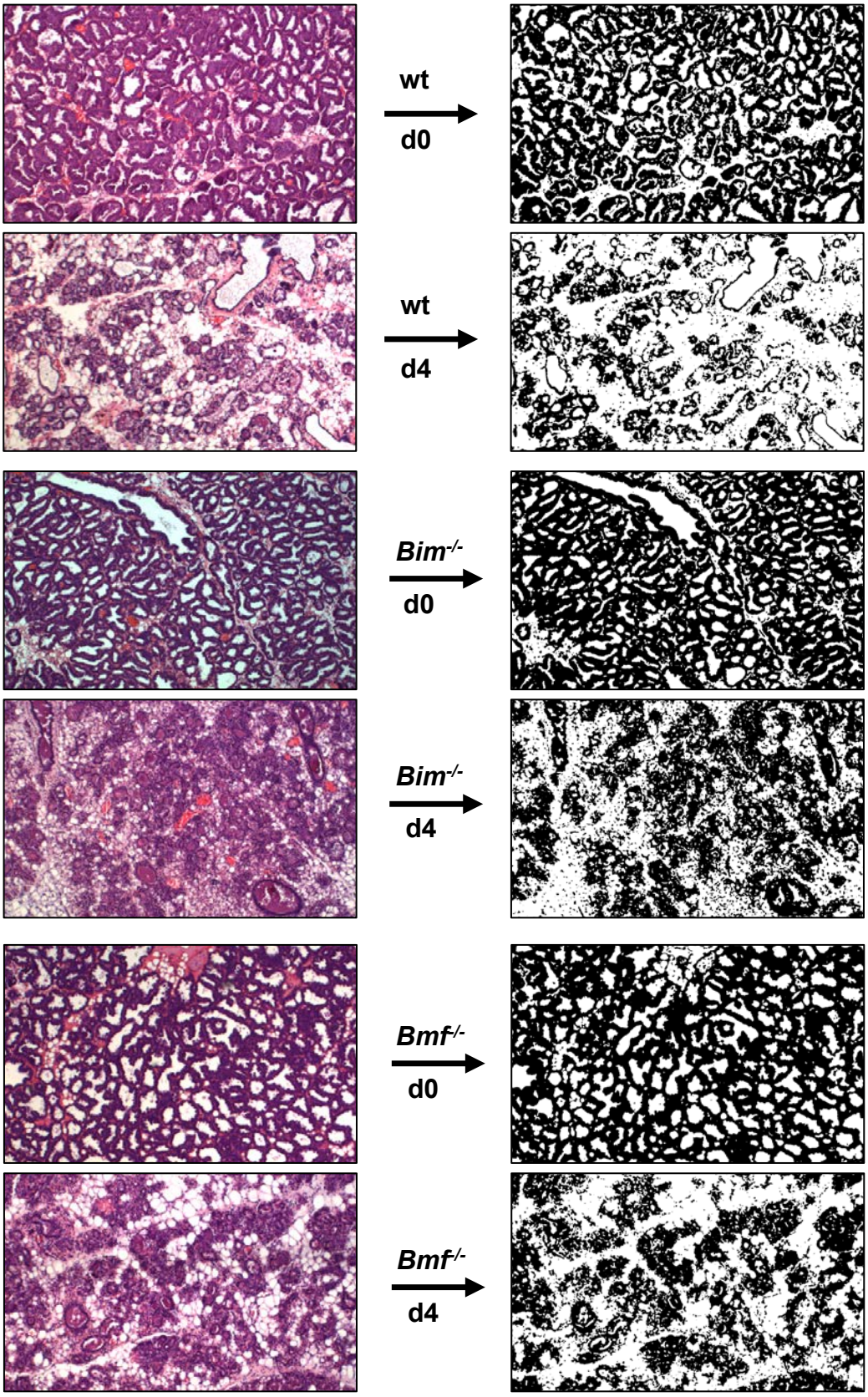
Figure S3: Sorting strategy used to isolate Annexin-V-negative, CD45+ hematopoietic or $CD49f^{+}CD45^{-}$ mammary epithelial cells from the mammary gland. Cells were lysed in TRIZOL for RNA isolation, used for cDNA synthesis and qRT-PCR analysis shown in Fig. 4b.

Figure S4: Representative images of the immunofluorescence analysis of Bim expression in (A) thymus from wt or *Bim*-deficient mice to confirm specificity of the antibody. (B) BIM expression in F4/80 positive macrophages or (C) Cytokeratin 8 (CK8) positive epithelial cells. Solid arrows show macrophages, open arrows epithelial cells. Scale bar represents 15µm.

Figure S5: Handling of immunofluorescence microscopy data for measurement of the BIM signal in $F4/80^{+}$ (A) and $CK8^{+}$ (B) cells in the lactating vs. involuting mammary gland. In brief, CK8 and F4/80 images were background- and contrast-corrected and converted into binary masks. Such masks were subtracted from the background- and contrast-corrected image of the Bim signal. Representative photos of a day 0 mammary gland are presented.

Reference

1. Kang K, Yamaji D, Yoo KH, Robinson GW, Hennighausen L: **Mammary-specific gene activation is defined by progressive recruitment of STAT5 during pregnancy and the establishment of H3K4me3 marks.** *Mol Cell Biol* 2014, **34:**464-473.


wt
d0
wt
d4
Bim-/-
d0
Bim-/-
d4
Bmf-/-
d0
Bmf-/-
d4

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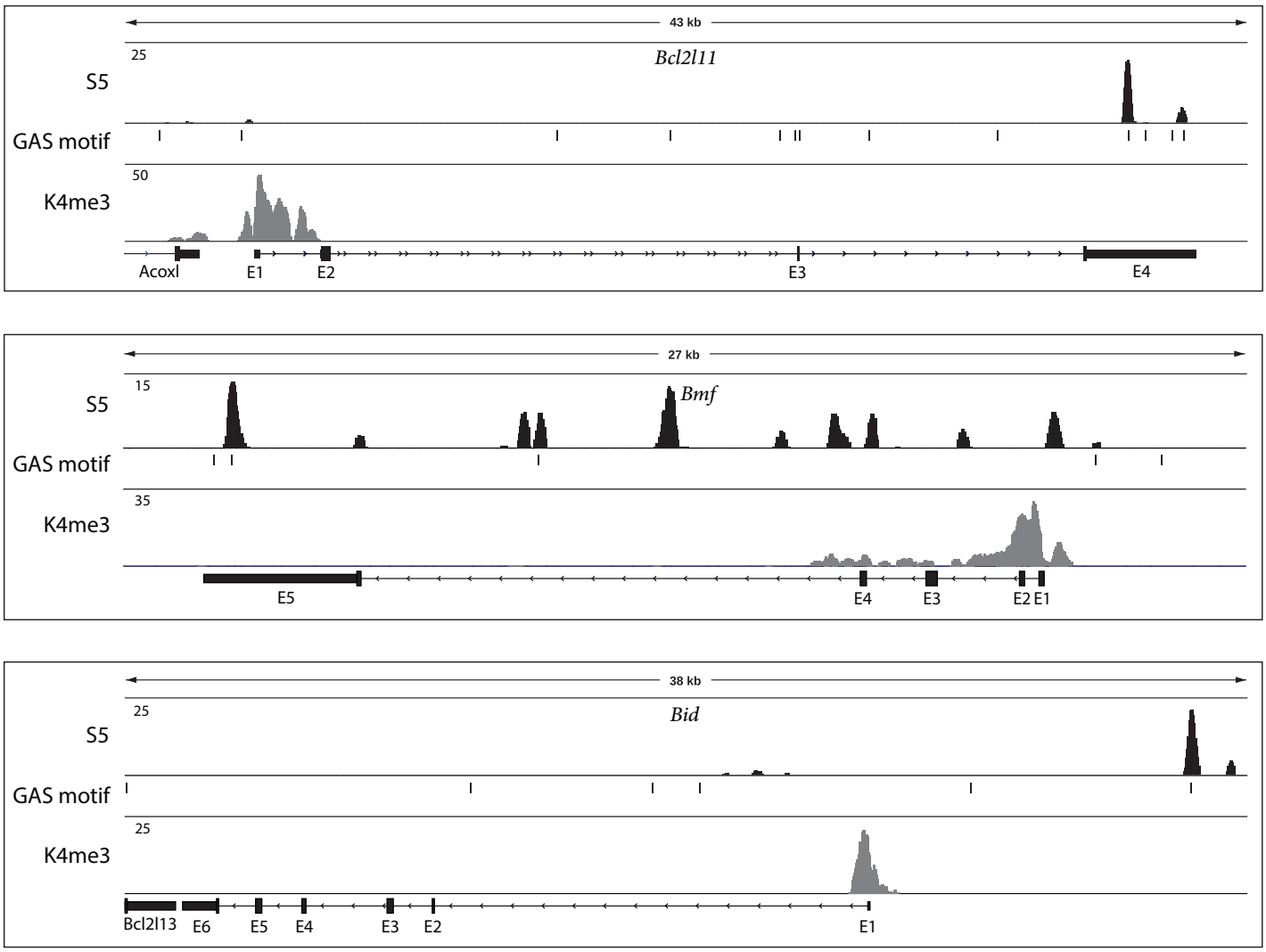

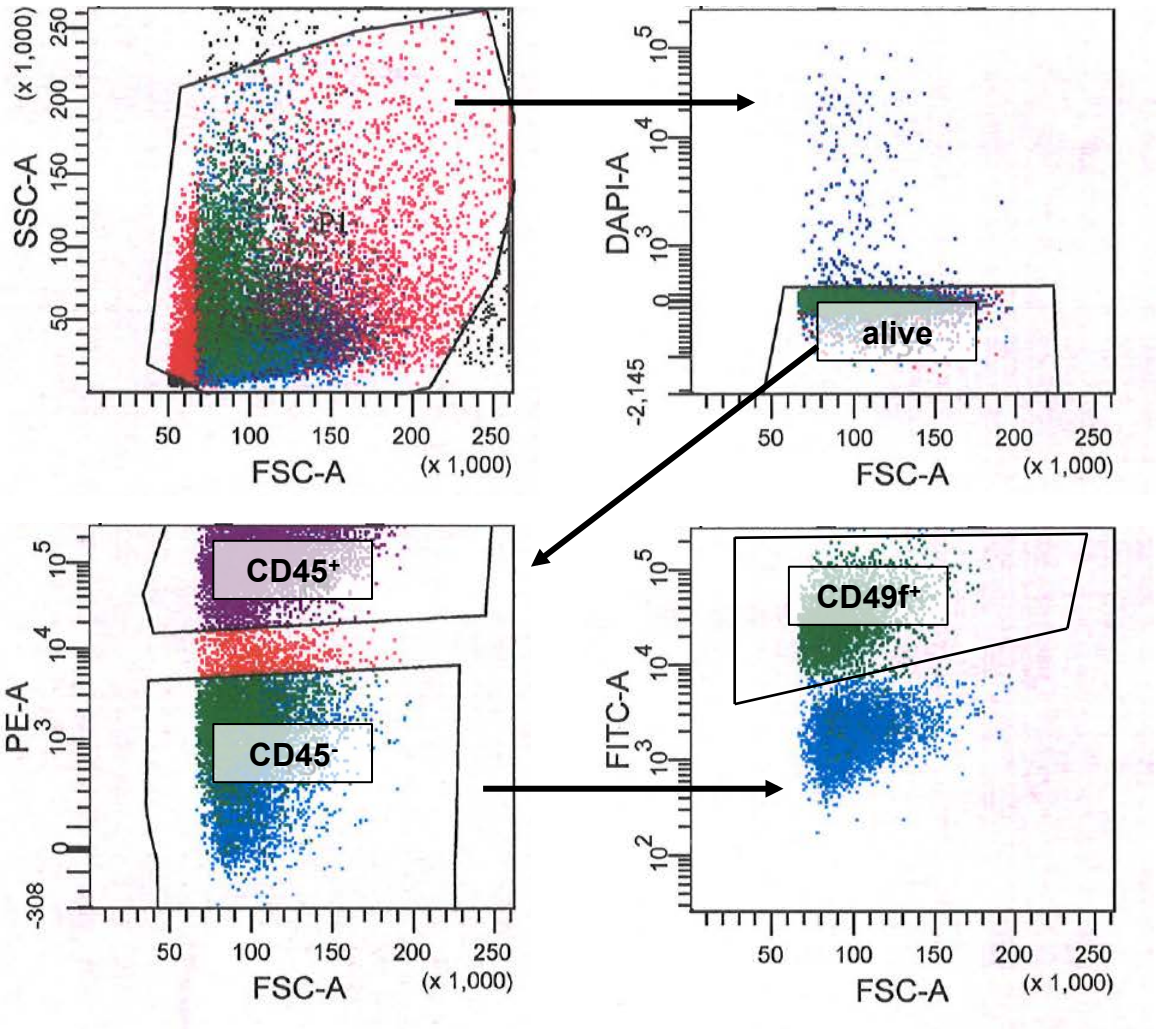
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(x 1,000)
250
200
150
100
50
P1
50
100
150
200
250
FSC-A
(x 1,000)
DAPI-A
10^5
10^4
10^3
0
-2,145
alive
50
100
150
200
250
FSC-A
(x 1,000)
PE-A
10^5
10^4
10^3
0
-308
CD45+
CD45-
50
100
150
200
250
FSC-A
(x 1,000)
FITC-A
10^5
10^4
10^3
10^2
CD49f+
50
100
150
200
250
FSC-A
(x 1,000)

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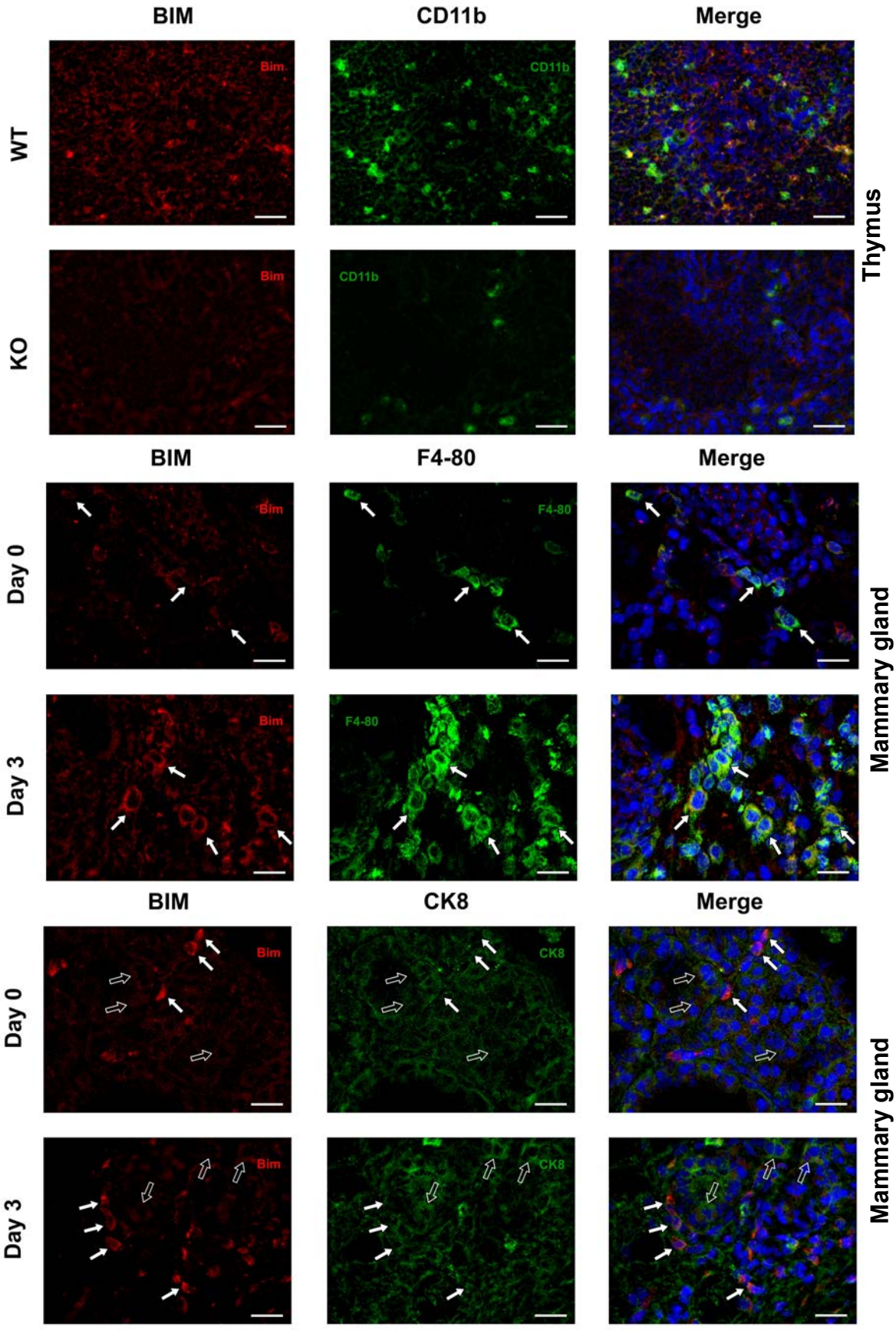

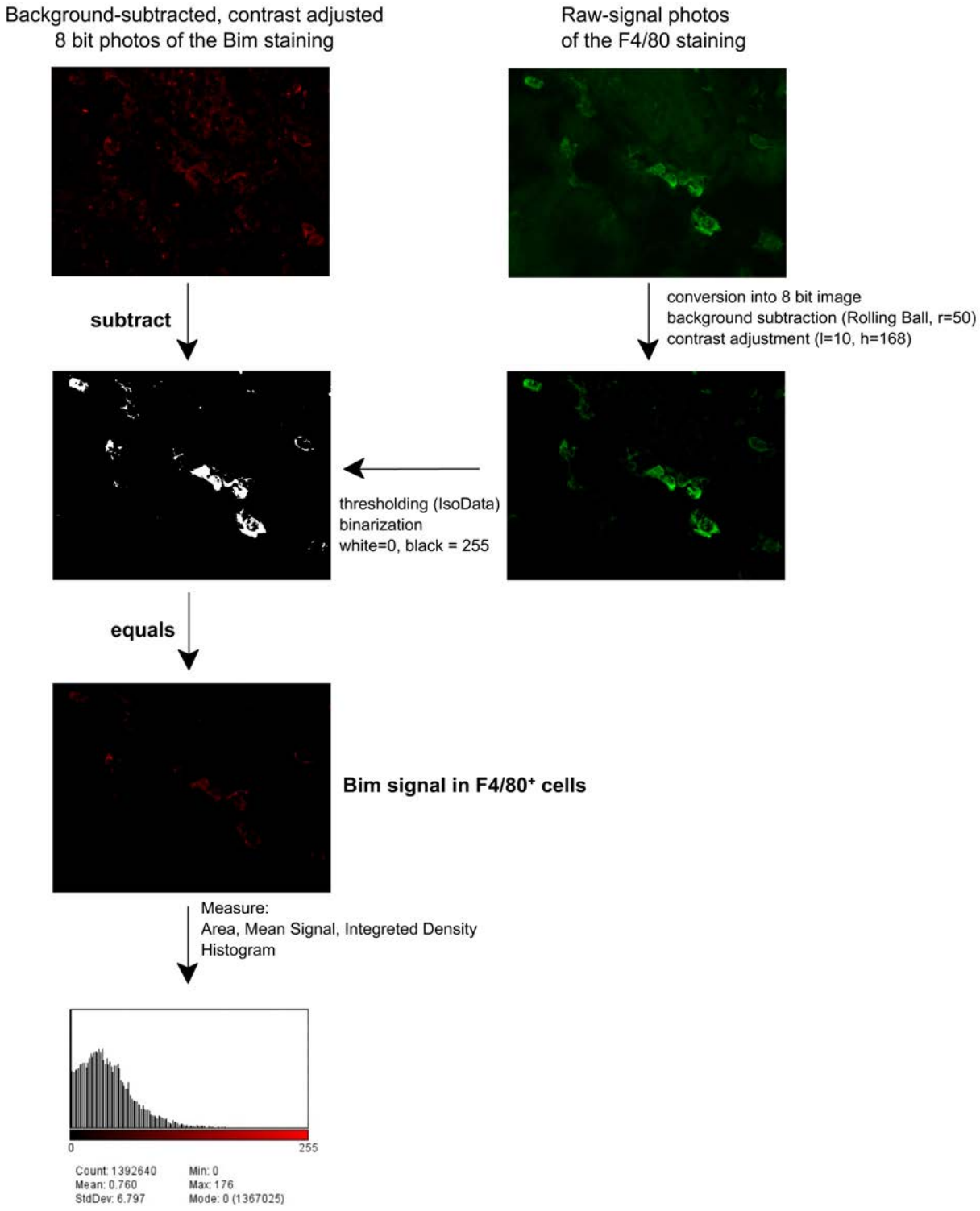
Background-subtracted, contrast adjusted
8 bit photos of the Bim staining
Raw-signal photos
of the F4/80 staining
subtract
conversion into 8 bit image
background subtraction (Rolling Ball, r=50)
contrast adjustment (l=10, h=168)
thresholding (IsoData)
binarization
white=0, black = 255
equals
Bim signal in F4/80+ cells
Measure:
Area, Mean Signal, Integreted Density
Histogram
0
255
Count: 1392640
Mean: 0.760
StdDev: 6.797
Min: 0
Max: 176
Mode: 0 (1367025)

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