Look@NanoSIMS

a tool for the analysis of nanoSIMS data in environmental microbiology

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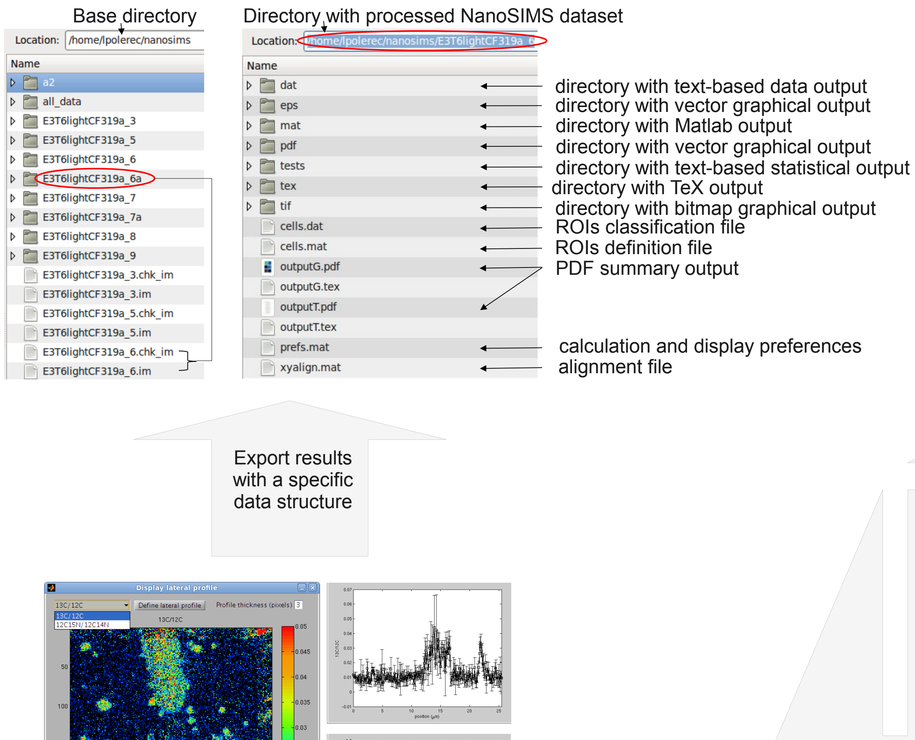
http://www.microsen-wiki.net/doku.php?id=lans

"Standard" features



Export results with a specific data structure

Fig. 5G: Lateral profiles of ROI ratios

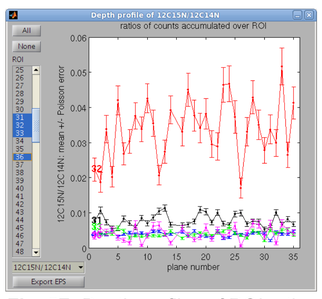


Fig. 5F: Depth profiles of ROI ratios

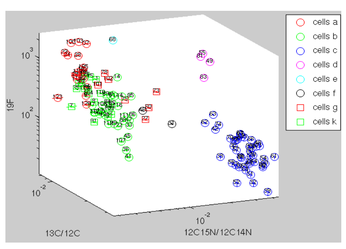


Fig. 5E: Scatter plots of ROI ratios

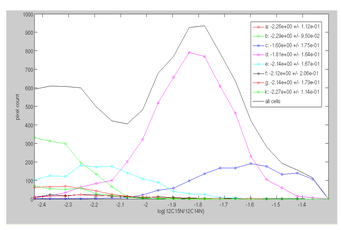


Fig. 5D: Ratio histograms in ROIs

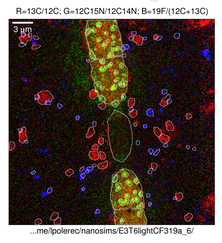


Fig. 5C: Ratio images (RGB composition)

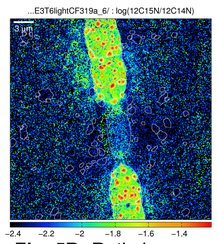


Fig. 5B: Ratio images (log-transformed)

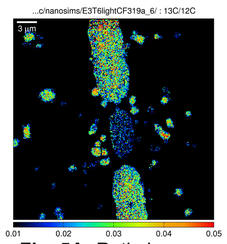
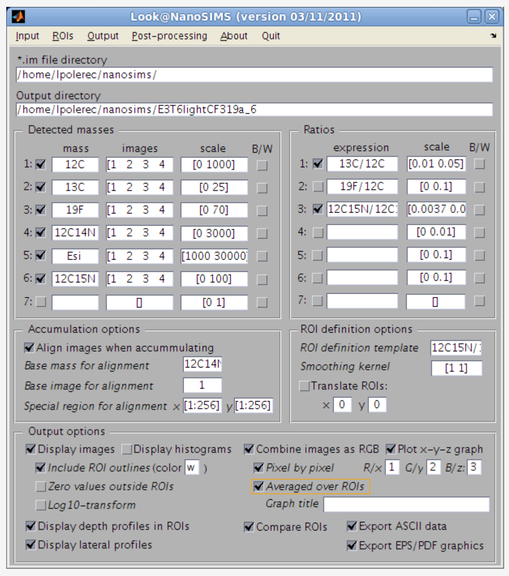


Fig. 5A: Ratio images (zero outside ROIs)

Main graphical user interface (GUI)



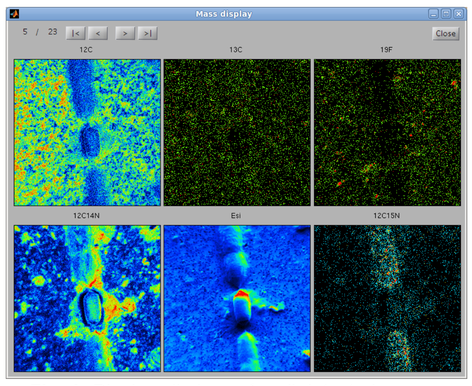


Fig. 1: Display all planes for all detected masses

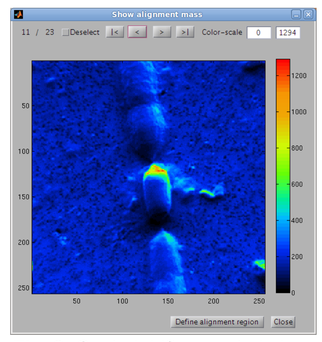


Fig. 2: Control drift-corrected plane accumulation

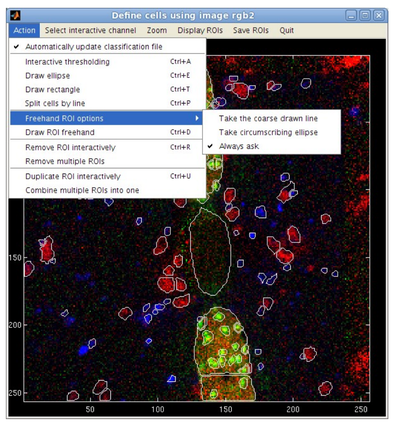


Fig. 3: Define ROIs interactively

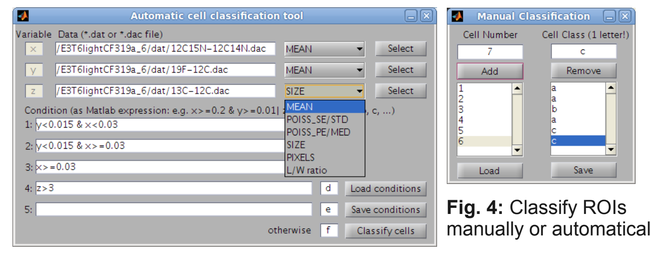
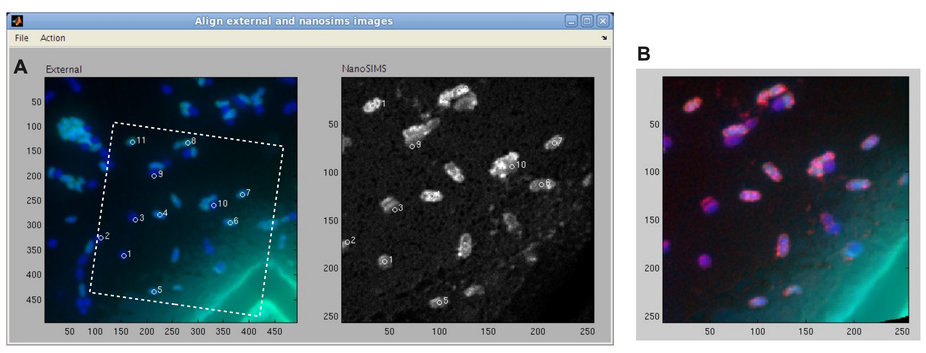


Fig. 4: Classify ROIs manually or automatically

Display results as ...

Novel features

Use an external image (e.g., FISH, SEM, TEM, AFM) as a template for ROI defision



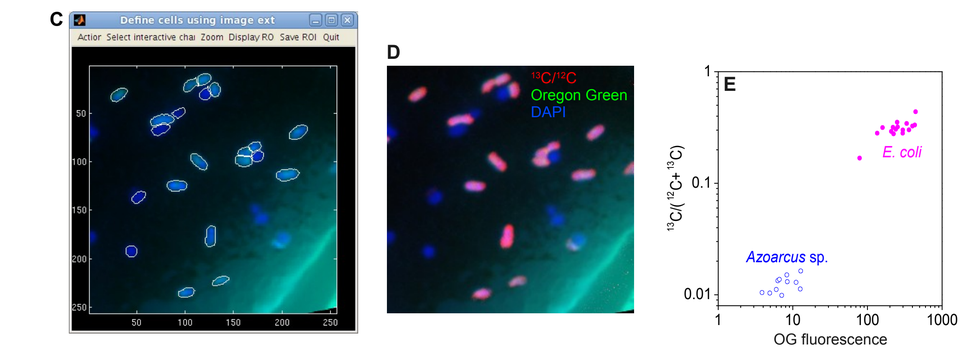


Fig. 6: (A) Tool for aligning the external and nanoSIMS images. **(B)** Overlay between the aligned external and nanoSIMS images. **(C)** ROI definition based on the aligned external image. **(D)** Overlay of FISH and $^{13}C.^{12}C$ images. **(E)** Scatter plot of Oregon green fluorescence (cell identity) and $^{13}C.^{12}C$ (cell activity) values averaged over cells.

Metafile processing: compile results from multiple analyzed datasets

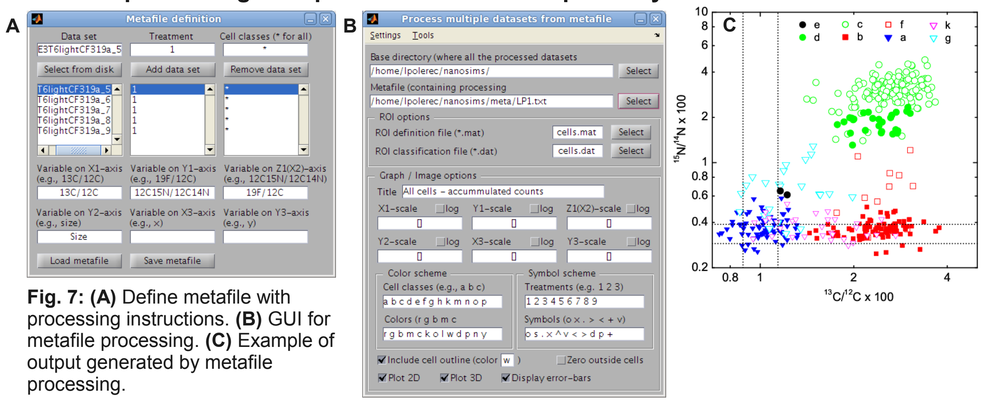


Fig. 7: (A) Define metafile with processing instructions. **(B)** GUI for metafile processing. **(C)** Example of output generated by metafile processing.

Statistical comparison of individual ROIs or ROI classes

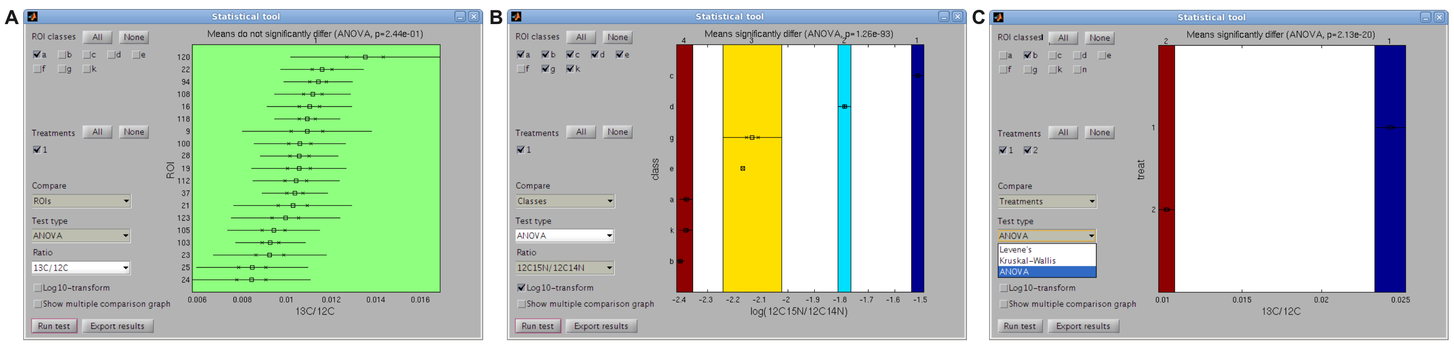


Fig. 8: GUI for comparison of ROIs **(A)**, ROI classes for one treatment **(B)** and treatments for one ROI class **(C)**. Possible tests: Lavene's (homogeneity of variance), ANOVA and Kruskal-Wallis (differences between means).

Comparison of Look@NanoSIMS with other programs for nanoSIMS data analysis

Feature / Function	Look@NanoSIMS	Open_MIMS	WinImage	L'Image
Dead-time and QSA correction	+	-	+	+
Display of scanned planes	+	+	+	+
Drift-corrected accumulation	+	+	+	+
ROI definition				
manual	+	+	+	+
semi-automated (interactive thresholding)	+	+	-	+
based on an external image	+	-	-	-
ROI classification				
manual	+	+	-	+
automated	+	-	-	-
Quantification of elemental and isotopic compositions				
images	+	+	+	+
histograms	+	+	-	+
depth profiles	+	+	+	+
lateral profiles	+	+	+	+
averages in ROIs	+	+	+	+
scatter plots of averages in ROIs†	+/+	-/-	-/-	+/-
dead time and QSA correction	+	+	+	+
δ-notation	-	-	-	+
arbitrary expressions	+	-	-	-
RGB composition	+	+	-	-
Image stitching	-	-	-	+
Statistical comparison of isotopic compositions				
in ROIs†	+/+	-/-	-/-	-/-
in ROI classes†	+/+	-/-	-/-	-/-
Open Source	+	+	-	-
Platform	Matlab 2010b‡ (multiplatform)	ImageJ 1.43‡ (multiplatform)	Aphelion (Windows XP‡)	PV-WAVE (Windows XP‡)
Availability	free (MPI Bremen)	free (NRIMS Harvard)	commercial (Cameca)	commercial (L.R. Nittler)

†single/multiple datasets ‡minimum version requirement