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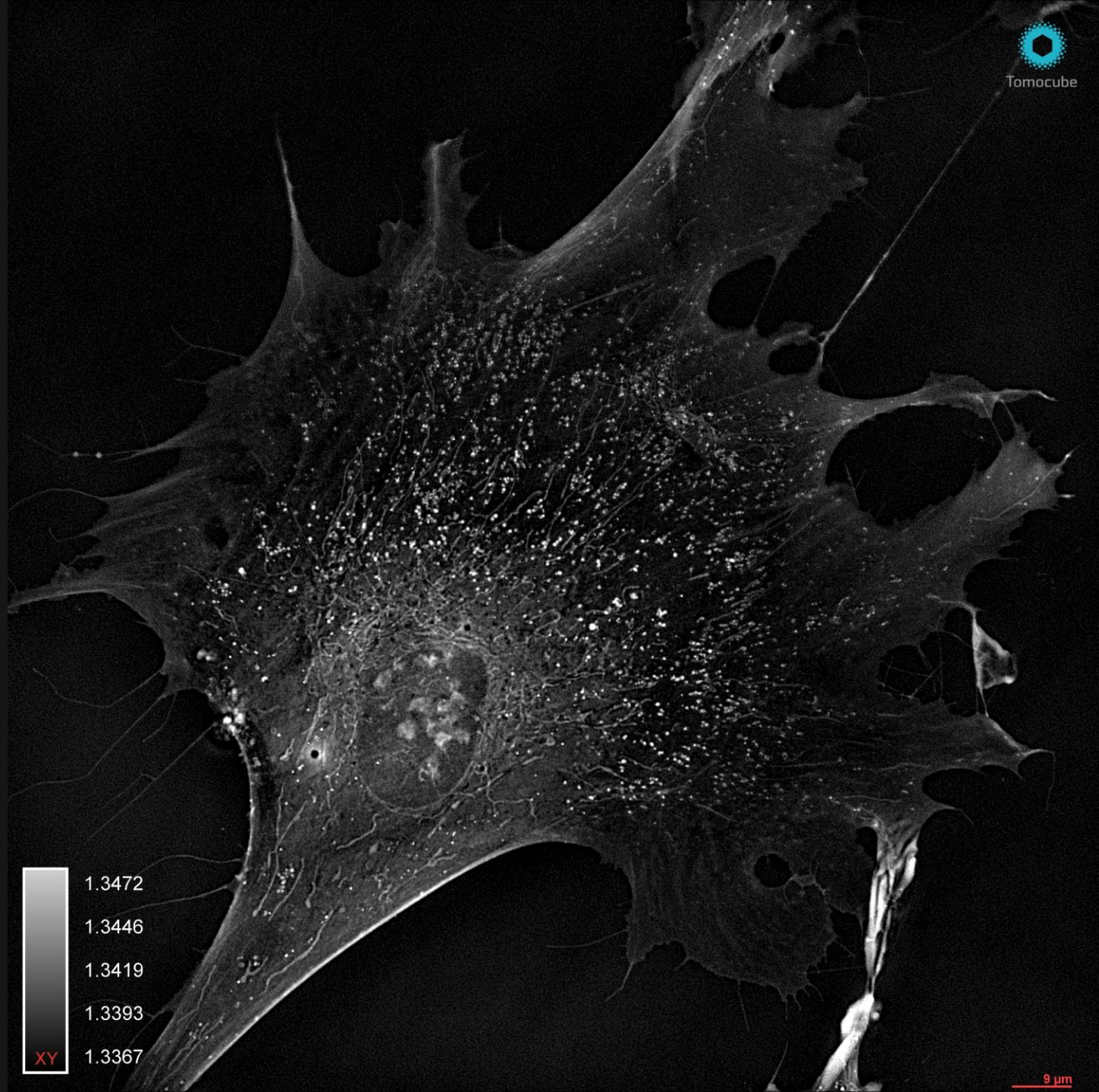
Holotomography

:Label free
3D live cell imaging
and quantification



Comparison of light microscopes

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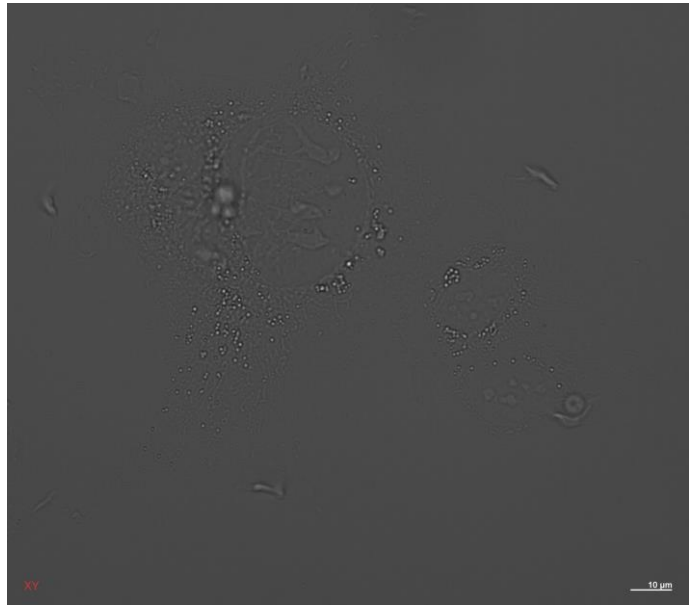

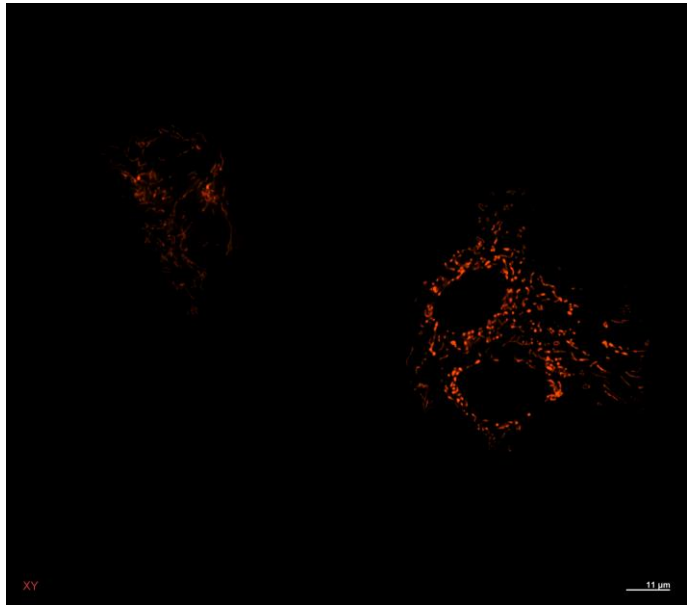

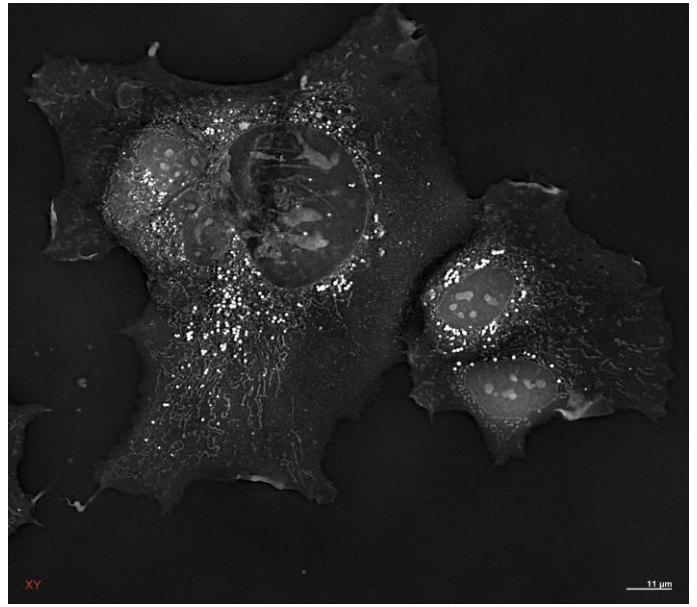

	Brightfield	Fluorescence microscopy	Holotomography
Sample	No labeling	Need fluorophore staining	No labeling
Time to data	Seconds	Minutes	Seconds
Phototoxicity	Low	High	Low
Image	2D	3D (Limited)	3D
Resolution	400 – 1000 nm	> 200 nm	110 – 200 nm
Quantification	Limited	Limited	Yes

Advantages of Holotomography

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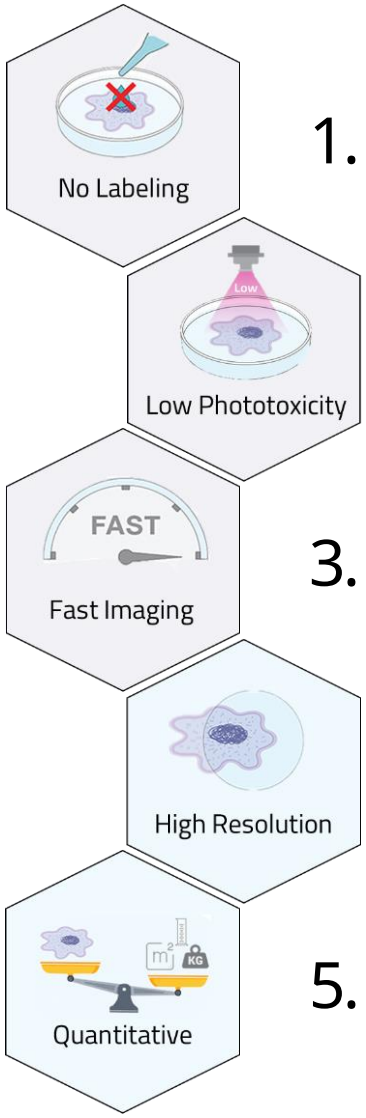
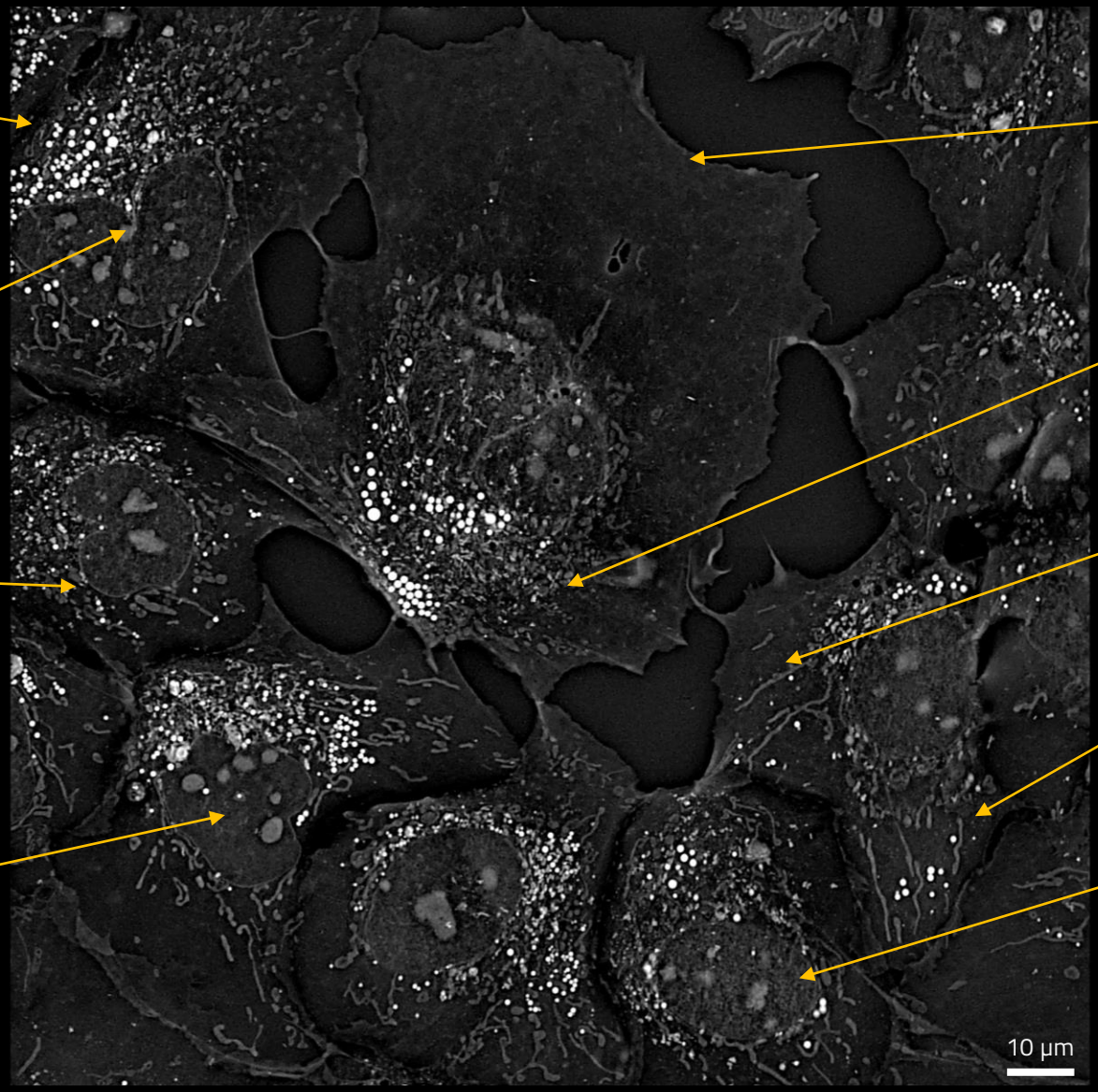
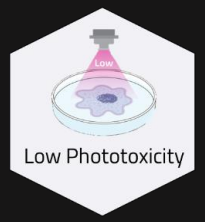


1. No invasive labeling for high-resolution organelle imaging
2. Safe monitoring of live cells with securing healthy conditions
3. Faster acquisition speed of 3D information
4. Higher resolution by using synthetic aperture
5. Consistent image intensity bearing the refractive index distribution

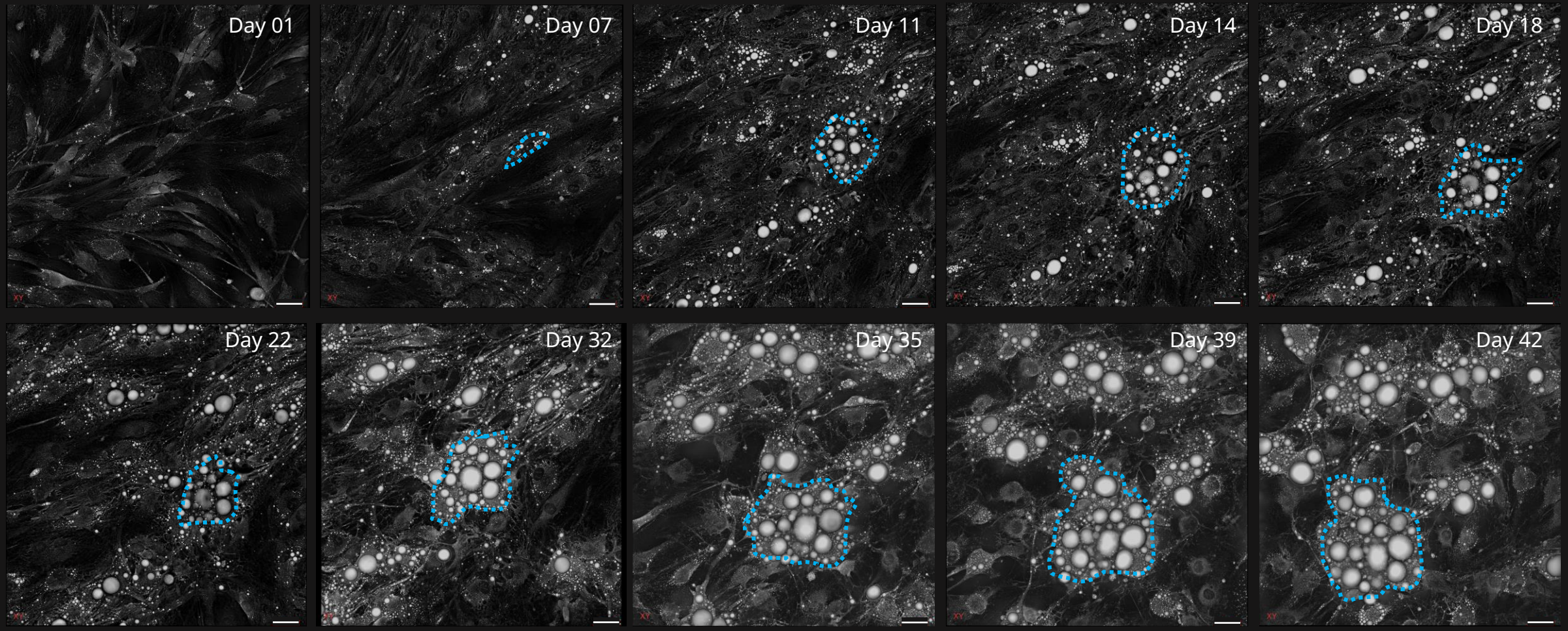
No Labeling

Label-free Multiplex Imaging of Subcellular Organelles





Redifferentiation of the cells after image acquisition for 42 days



400 µm × 400 µm × 60 µm, 3 × 3 tile imaging. Scale bar: 40 µm. Image courtesy: Hye-Jin Kim, Tomocube

Tomocube HT-X1 Holotomography

Specifications

- Objective lens: 40× NA 0.95 air
- Light source: LED (Holotomography, Fluorescence)
- Maximum lateral resolution: 156 nm
- Maximum axial resolution: 1.07 µm
- Field-of-view: max. 218 µm × 165 µm
- Fluorescence: 4 excitation channels (max. 3-channel overlay)
  - Light sources (nm, bandwidth): 385/10, 475/20, 565/104, 625/17
- Stage: motorized stage with an auto focus module
- Size: 565×732×921 (L×D×H, mm)
- Weight: 90 kg

Compatible samples & labware

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#1.5H (0.17 mm) bottom thickness, Glass or polymer

- ✓ TomoDish (50 mm), 35-mm imaging dish
- ✓ 6 well, 12 well, 24 well plates
- ✓ Tomocube HT-Ready 96 well plate
- ✓ Microscopic slide (place coverslip slide down)
- ✓ Channel slides, Chamber slides
- ✓ Custom microfluidic devices

- Optically transparent
- Transparent medium: liquid, hydrogel, agarose, …
- Sample thickness under < 150 μm
    - Multilayered cells, small organoids, spheroids, …

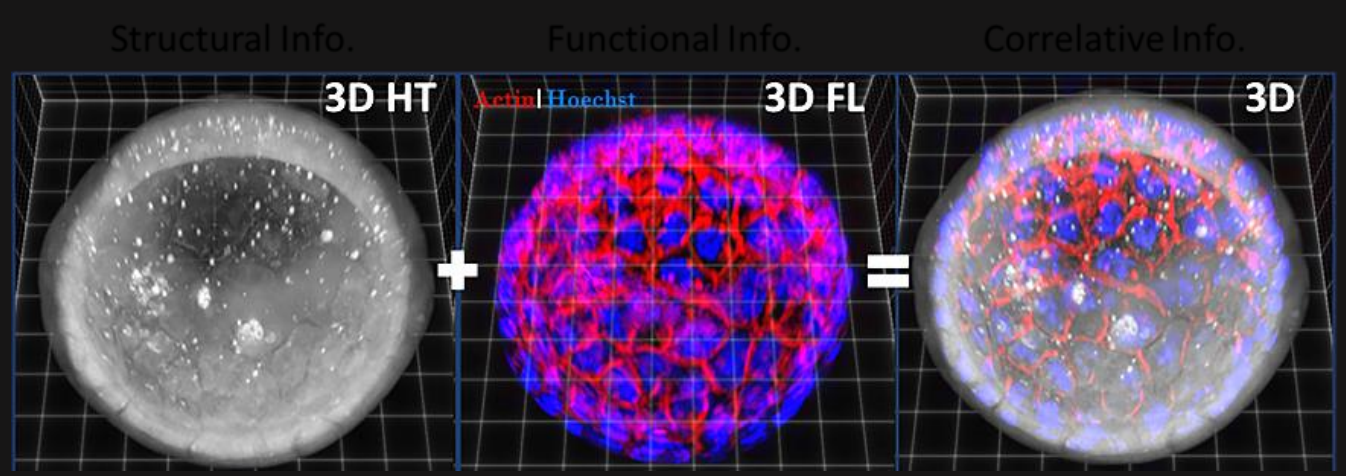
Correlative imaging

High-performance 3D fluorescence imaging

- Z stacking with precise stage control
- Minimized crosstalk with emission filters
- Blind deconvolution from 2D slices (AutoQuant)

Support for various light sources

- Four standard light sources: DAPI/FITC/TRITC/Cy5
- Accessible for external light source (optional)



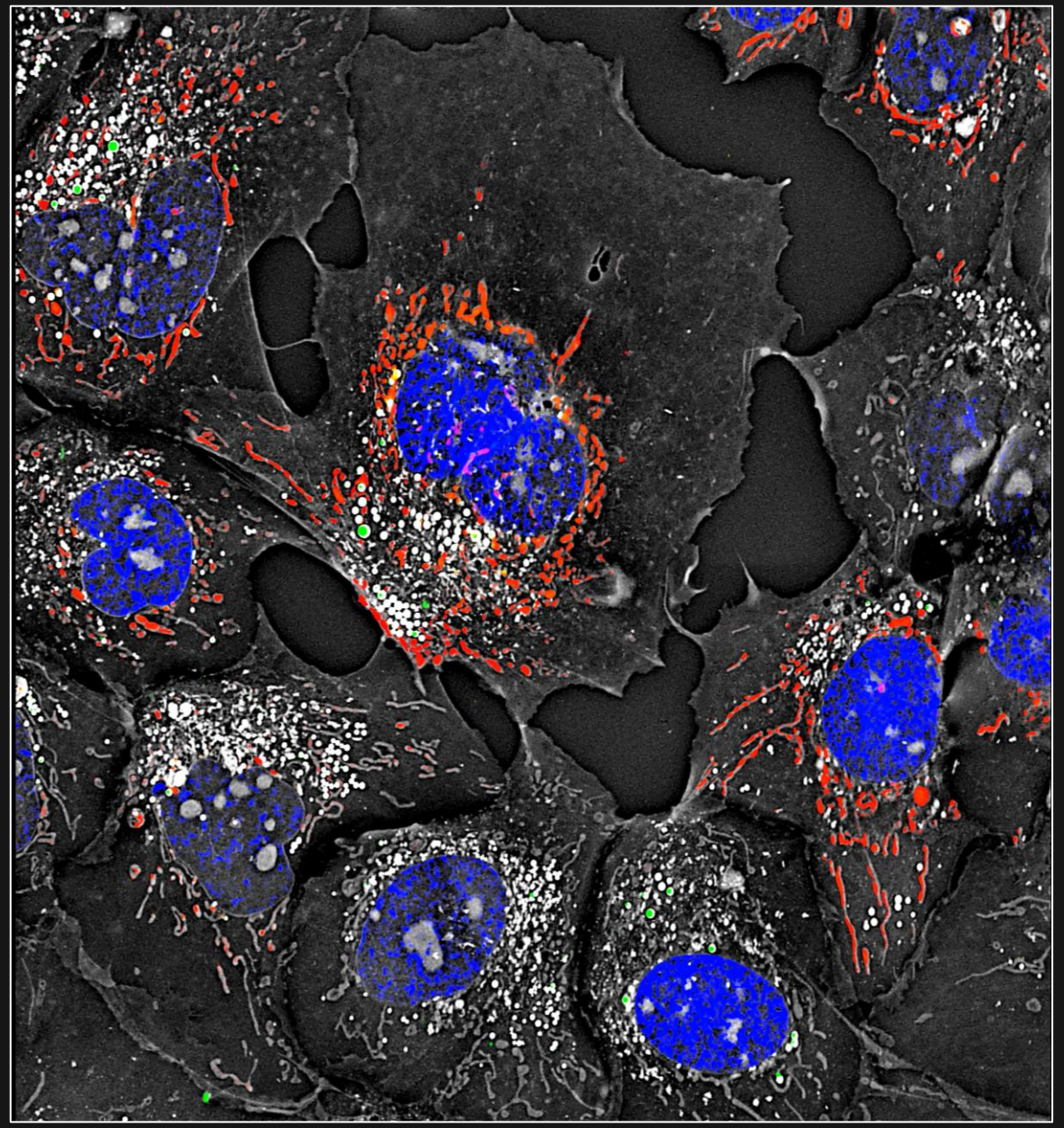


Image analysis using TomoAnalysis

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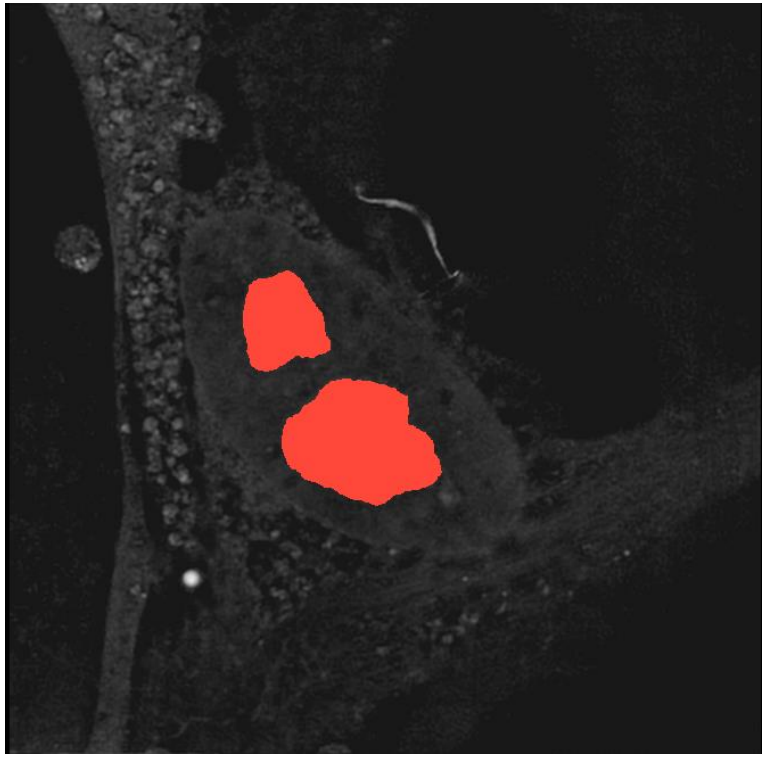
Fluorescence-tagged objects

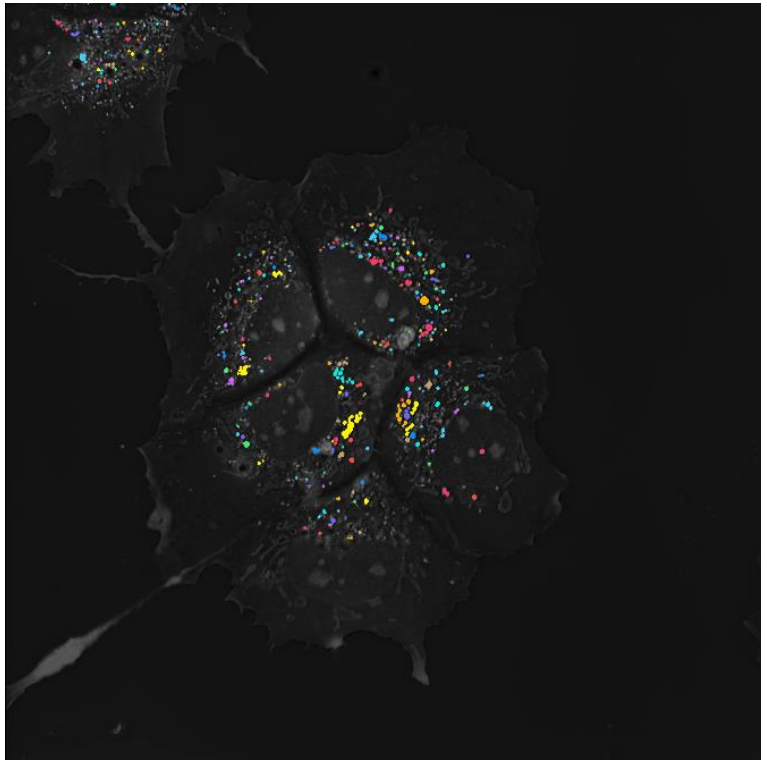


Default Report

	CentroidX	CentroidY	CentroidZ	Concentration	Drymass	Label-FL-idx	MeanRI
1	-2.49282	5.66196	-0.0401925	0.0504549	38.3148	1	1.34659
2	-9.1824	-4.99318	0.279003	0.0556641	14.9589	2	1.34758
3	7.37628	15.1781	-1.70821	0.0567249	0.00173312	3	1.34778
4	-8.88935	-1.37123	3.41641	0.0586842	0.000199221	4	1.34815
5	-7.56541	-1.04024	3.41641	0.0442105	7.50427e-05	5	1.3454
6	-7.70726	-0.709255	3.70111	0.0397368	0.000539593	6	1.34455

Measure-FL-RI | Show Summary | Reset Sort

Uniform objects – Lipid Droplets

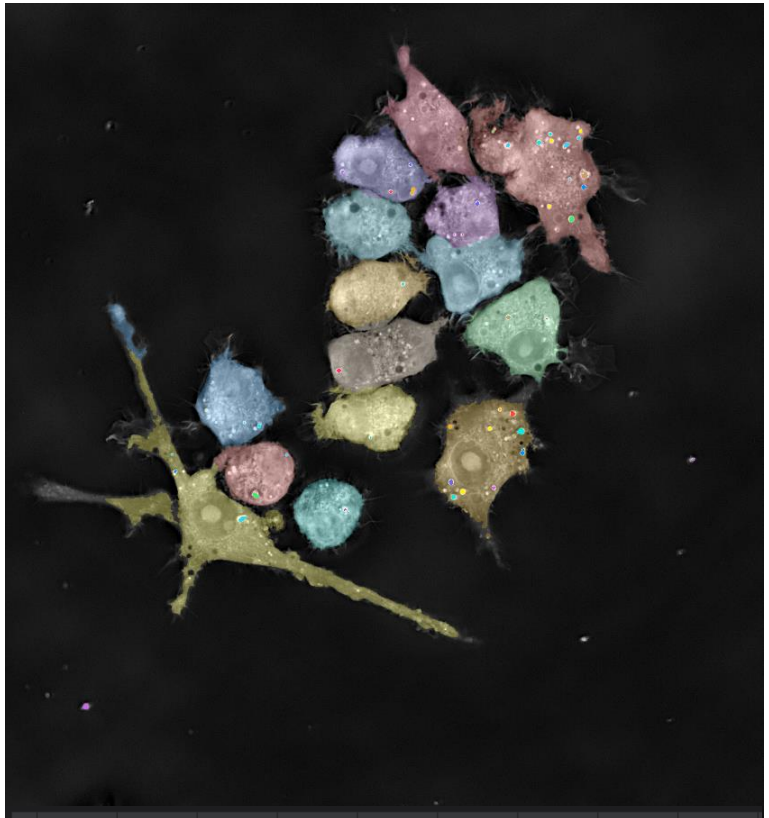


Default Report

	CentroidX	CentroidY	CentroidZ	Concentration	Drymass	Label-LD-idx	Mean
1	-59.1265	-63.3573	-7.65404	0.220579	1.04327	1	
2	8.3512	-17.086	-8.00574	0.279254	1.65376	2	
3	-7.22699	9.13197	-7.72655	0.2593	5.06023	3	
4	-62.6163	-79.5871	-7.6599	0.17358	0.020697	4	
5	-57.0999	-79.4389	-7.85488	0.245215	0.243654	5	
6	-45.3855	-79.3921	-7.79917	0.200592	0.119589	6	

Measure-LD | Show Summary | Reset Sort

Objects with an internal structure



	CentroidX	CentroidY	CentroidZ	ncentration(pg/μr	Drymass(pg)	abel-Cell-parentid	Label-LD-idx	MeanRI	rojectedArea(μm²
1	-56.81	-57.98	-1.89	0.209	0.06700	-1	1	1.3652	0.34
2	5.49	-66.14	-0.95	0.268	0.10420	11	2	1.3732	0.41
3	30.70	-54.95	-0.18	0.356	0.21200	1	3	1.3851	0.51
4	20.59	-54.79	-0.95	0.244	0.02790	1	4	1.3699	0.12
5	28.27	-54.63	-0.18	0.392	0.24220	1	5	1.3899	0.53
6	22.01	-54.07	-0.66	0.327	0.38910	1	6	1.3812	0.87
7	33.54	-53.95	0.26	0.304	0.35470	1	7	1.3780	0.92
8	17.39	-54.05	-0.95	0.226	0.07230	1	8	1.3675	0.34
9	2.62	-50.23	-0.28	0.324	0.12600	9	9	1.3807	0.29

For more information

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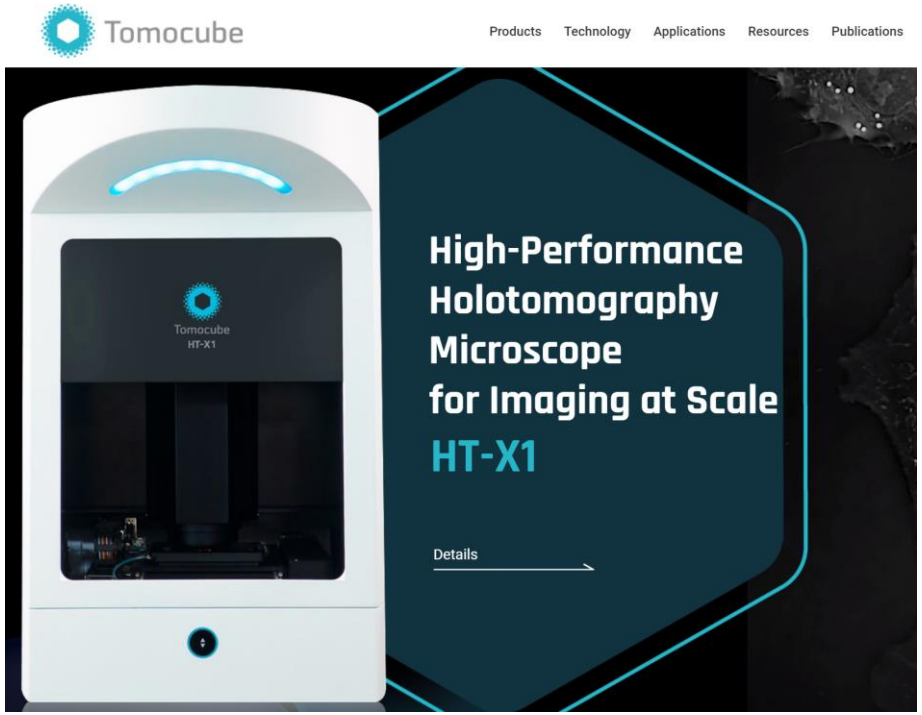
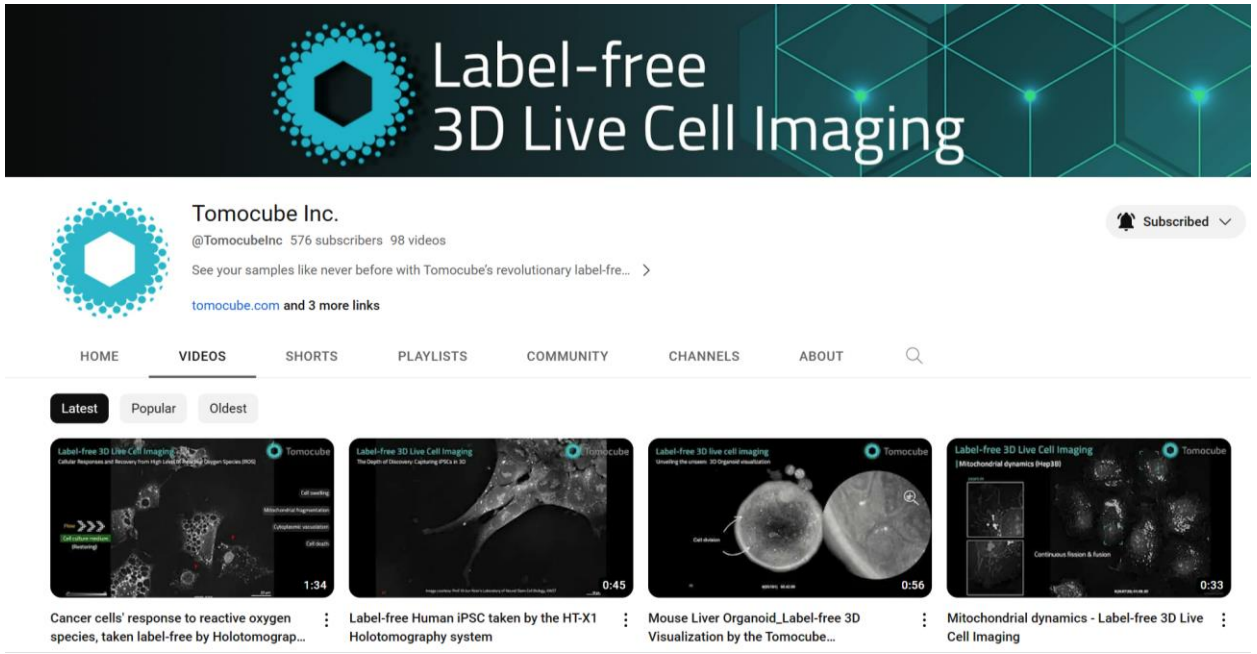
www.tomocube.com

www.youtube.com/tomocubeinc





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