

Materials List for:

# Visualization of ATP Synthase Dimers in Mitochondria by Electron Cryotomography

Karen M. Davies<sup>1</sup>, Bertram Daum<sup>1</sup>, Vicki A. M. Gold<sup>1</sup>, Alexander W. Mühleip<sup>1</sup>, Tobias Brandt<sup>1</sup>, Thorsten B. Blum<sup>1</sup>, Deryck J. Mills<sup>1</sup>, Werner Kühlbrandt<sup>1</sup>

<sup>1</sup>Department of Structural Biology, Max Planck Institute of Biophysics

Correspondence to: Werner Kühlbrandt at [werner.kuehlbrandt@biophys.mpg.de](mailto:werner.kuehlbrandt@biophys.mpg.de)

URL: <https://www.jove.com/video/51228>

DOI: [doi:10.3791/51228](https://doi.org/10.3791/51228)

## Materials

Name	Company	Catalog Number	Comments
Sucrose	Roth	4621.2	
Trehalose	Sigma-Aldrich	T9449	
HEPES	Sigma-Aldrich	H3375	
Zymolase	biomol	Z1000.1	
Density gradient medium	Sigma-Aldrich	D1556 or P1644	
Protein A gold	Aurion	810.111	10 nm
Ethane	Air Liquide	P0502S02R0A001	
Nitrogen	Air Liquide	I4150RG	
<b>Consumables</b>			
Filter paper	Whatman, GE Healthcare	1004 090	Nr 4
Tweezers	Dumont	T506	Non-magnetic, pattern #5
EM combined test grid	Plano GmbH	S142	grapite and gold islands on holey carbon film
Holey carbon grids	Quantifoil Micro Tools GmbH or C-flat		R2/2 300 Cu mesh
Cryo grid boxes	Plano GmbH	160-42	Alternative home-made metal boxes
Potter	Sigma-Aldrich	P7984	
Blender	Waring	8011S	
Glass bead mill - bead beater	BioSpec Products	1107900-105	Including 0.5 mm beads
Ball-bearing (Balch) homogeniser	isobiotec	H8	
Centrifuge	Thermo Scientific	46915	Sorvall RC6+
Glow-discharge apparatus	Bal-Tec A.G.	CTA 010	
Grid vitrification device	FEI, Gatan or Leica		Alternative home-made plunger
Transmission electron microscope	FEI or Jeol		300 keV
Direct electron detector	Gatan	K2 summit	4k x 4k pixels, counted mode
Charge coupled device (CCD)	Gatan	US4000	4k x 4k pixels (alternative to Direct electron detector)
Energy filter	Gatan or Jeol		
<b>Software</b>			
Image acquisition software	Gatan		
Tomogram acquisition software	Gatan, FEI, USCF, or UC-Boulder		4 alternatives
Tomogram processing software	FEI, UCSF or UC-Boulder		3 alternatives
Subtomogram averaging software	UC-Boulder, or University of Basel		2 alternatives

Tomogram visualization software	UC-Boulder, FEI, or University of Utah		3 alternatives
Visualization software plugin	Goethe university		<a href="http://www.biophys.uni-frankfurt.de/frangakis/">http://www.biophys.uni-frankfurt.de/frangakis/</a>
Structure visualization software	UCSF		<a href="http://www.cgl.ucsf.edu/chimera/">http://www.cgl.ucsf.edu/chimera/</a>
Numerical calculation software	MathWorks		<a href="http://www.mathworks.de/academia/">http://www.mathworks.de/academia/</a>