



Sep 03, 2021

# MicroCT protocols for scanning of embryos and juvenile *Hexaplex trunculus*

Eva Chatzinikolaou<sup>1</sup>, Kleoniki Keklikoglou<sup>1</sup><sup>1</sup>Hellenic Centre for Marine Research

1 Works for me



Share

[dx.doi.org/10.17504/protocols.io.bxw4ppgw](https://dx.doi.org/10.17504/protocols.io.bxw4ppgw)

MicroCT Lab HCMR

Eva Chatzinikolaou

## DISCLAIMER

DISCLAIMER – FOR INFORMATIONAL PURPOSES ONLY; USE AT YOUR OWN RISK

The protocol content here is for informational purposes only and does not constitute legal, medical, clinical, or safety advice, or otherwise; content added to [protocols.io](https://protocols.io) is not peer reviewed and may not have undergone a formal approval of any kind. Information presented in this protocol should not substitute for independent professional judgment, advice, diagnosis, or treatment. Any action you take or refrain from taking using or relying upon the information presented here is strictly at your own risk. You agree that neither the Company nor any of the authors, contributors, administrators, or anyone else associated with [protocols.io](https://protocols.io), can be held responsible for your use of the information contained in or linked to this protocol or any of our Sites/Apps and Services.

## ABSTRACT

Micro-computed tomography (micro-CT) is a high-resolution 3D-imaging technique which is now increasingly applied in biological studies focusing on taxonomy and functional morphology. The creation of virtual representations of specimens can increase availability of otherwise underexploited and inaccessible samples. This protocol aims to standardise micro-CT scanning procedures for embryos and juveniles of the marine gastropod species *Hexaplex trunculus*.

## DOI

[dx.doi.org/10.17504/protocols.io.bxw4ppgw](https://dx.doi.org/10.17504/protocols.io.bxw4ppgw)

## PROTOCOL CITATION

Eva Chatzinikolaou, Kleoniki Keklikoglou 2021. MicroCT protocols for scanning of embryos and juvenile *Hexaplex trunculus*. **protocols.io**  
<https://dx.doi.org/10.17504/protocols.io.bxw4ppgw>

## FUNDERS ACKNOWLEDGEMENT

ECCO project, Hellenic Foundation for Research and Innovation ( HFRI)  
Grant ID: project ID 343

## KEYWORDS

microCT, gastropods, embryos, juveniles, scanning, *Hexaplex trunculus*

## LICENSE

— This is an open access protocol distributed under the terms of the [Creative Commons Attribution License](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

CREATED

Sep 02, 2021

LAST MODIFIED

Sep 03, 2021

PROTOCOL INTEGER ID

52924

DISCLAIMER:

DISCLAIMER – FOR INFORMATIONAL PURPOSES ONLY; USE AT YOUR OWN RISK

The protocol content here is for informational purposes only and does not constitute legal, medical, clinical, or safety advice, or otherwise; content added to [protocols.io](https://protocols.io) is not peer reviewed and may not have undergone a formal approval of any kind. Information presented in this protocol should not substitute for independent professional judgment, advice, diagnosis, or treatment. Any action you take or refrain from taking using or relying upon the information presented here is strictly at your own risk. You agree that neither the Company nor any of the authors, contributors, administrators, or anyone else associated with [protocols.io](https://protocols.io), can be held responsible for your use of the information contained in or linked to this protocol or any of our Sites/Apps and Services.

#### Sample preparation

42m

- 1 Removal of embryos of *Hexaplex trunculus* from their egg capsules. 10m
- 2 Anesthetization of embryos and juvenile gastropods with 7% MgCl<sub>2</sub>. 30m
- 3 Sample placement inside a plastic white pipette tip without any scanning medium (in the air). 2m

#### microCT scanning

2h 23m

- 4 2h 23m

SkyScan 1172  
micro-computed tomographer (microCT)

**Bruker**      **10L01170**      [↗](#)

Detail detectability: <1 µm  
Low contrast resolution (10% MTF): 5 µm  
Pixel size at maximum magnification: <0.8 µm

X-ray source:  
Sealed microfocus X-ray tube, air cooled,  
>10,000h lifetime;  
Spot size <5µm @ 4W, 20-100kV, 0-250 µA  
(10W max)

X-ray detector (camera): 11 Megapixel  
(4000X2300) 12-bit digital CCD-camera with  
fibre optic coupling to scintillator

Maximum object size: 50 mm in diameter using  
offset scan

Radiation safety: < 1 µSv/h at any point on the  
instrument surface

#### 4.1 Scanning parameters for embryos and juvenile *Hexaplex trunculus*

2h 23m

Voltage: 59 kV  
Current :167 µA  
Filter: none  
Pixel size: 2 µm  
Camera binning: 1 × 1  
Exposure time: 325 ms for embryos and 316 ms for juveniles  
Rotation: 360° for embryos and 180° for juveniles  
Rotation step: 0.20° for embryos and 0.25° for juveniles  
Frame averaging: 3 for embryos and 5 for juveniles


#### Images reconstruction 20m

- 5 Projection images were reconstructed into cross sections using the SkyScan's NRecon software (Bruker, Kontich, Belgium) 20m

#### 5.1 Upload projection images 2m

#### 5.2 Perform X-Y alignment 2m

#### 5.3 Reconstruction parameters 16m



Smoothing: 2  
Ring artifact correction: 20  
Beam hardening correction: 59%  
Attenuation coefficients: 0 - 1.127 for embryos and 0 - 1 for juveniles  
Save as: 16-bit TIFF images