

Aug 24, 2024

Refractive index adjusted imaging medium: Iodixanol (RI ~ 1.4) - Yeast

DOI

dx.doi.org/10.17504/protocols.io.dm6gpz3kjlzp/v1



Mathias Hammer¹, Ammeret Rossouw¹, Azra Lari², Ben Montpetit³, David Grunwald¹

¹UMass Chan Medical School, RNA Therapeutics Institute, Worcester, MA, USA;

²University of Alberta, Department of Cell Biology, Edmonton, AB, Canada;

³University of California, Department of Viticulture and Enology, Davis, CA, USA



Mathias Hammer

UMASS Chan Medical School/RTI

OPEN ACCESS



DOI: dx.doi.org/10.17504/protocols.io.dm6gpz3kjlzp/v1

Protocol Citation: Mathias Hammer, Ammeret Rossouw, Azra Lari, Ben Montpetit, David Grunwald 2024. Refractive index adjusted imaging medium: Iodixanol (RI ~ 1.4) - Yeast. [protocols.io https://dx.doi.org/10.17504/protocols.io.dm6gpz3kjlzp/v1](https://dx.doi.org/10.17504/protocols.io.dm6gpz3kjlzp/v1)

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

Protocol status: Working

We use this protocol and it's working

Created: May 27, 2024

Last Modified: August 24, 2024

Protocol Integer ID: 100685

Keywords: yeast imaging, yeast refractive index, life cell imaging, Iodixanol

Funders Acknowledgement:

NSF

Grant ID: 1917206



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and does not constitute legal, medical, clinical, or safety advice, or otherwise; content added to **protocols.io** is not peer reviewed and may not have undergone a formal approval of any kind.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**, 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

This protocol describes the steps to prepare imaging medium for *Saccharomyces cerevisiae* with adjusted refractive index. This medium is optimized for fluorescence imaging by the reduction of auto-fluorescence through an abundance of Adenine [1] and the repression of of the Met-promoted pp7- CP expression [2].

Materials

SC-Ura Powder

Sunrise Science Products

Cat#: 1306-030

Lot#: 23K3083

Exp: 10/2027

Yeast Nitrogen Base Without Amino Acids

Sigma Life Science

Cat#: Y0626-250G

Lot#: SLBG0555V

Glucose

Sunrise Science Products

Cat#: 1907-1kg

Lot#: 3A0036

L-Adenine

Sigma Life Science

Cat#: A-9795

Lot#: 33H12895

L-Methionine

Sigma Life Science

Cat#: M-5308

Lot#: 129H0322

OptiPrep Density Gradient Medium

Sigma Life Science

Cat#: D1556-250ML

Lot#: 120M1221

Deionized Water

Equipment:

50 ml laboratory bottle with screw cap

1ml pipette

25 ml pipette

stirring hot plate

magnetic stirring bar

micro scales



autoclave

thermometer

Before start

Have the following solutions premixed:

Glucose 20% 500 ml solution:

Concentration: 200 g/l

mix 100 g Glucose in 500 ml deionized water (ddH₂O)

Adenine 100x 100 ml solution:

Concentration 3 g/l

mix 0.3 g Adenine in 100 ml ddH₂O

Methionine 200x 50 ml:

Concentration: 17.12 g/l

mix 856 mg into 50 ml ddH₂O

Optional:

SC-xx 10x 100ml solution:

Concentration: 19.2 g/l

mix 1.92 g into 100 ml ddH₂O

YNB 20x 100ml solution:

Concentration: 134.4 g/l

mix 13.44 g into 100 ml ddH₂O




1 Compound medium for autoclave

STEP CASE

Medium preparation with pre-resolved components 9 steps


This version of the protocol shows the preparation of the medium from SC-XX 10x and YNB 20x solutions.

- 1.1 Fill a 50 ml flask with  21 mL OptiPrep.
Add a magnetic stirring bar and place the flask on a stirring hot plate.

- 1.2 Add  0.3 mL Adenine 100x solution.

Note

The additional Adenine is supposed to repress the Adenine synthesize to reduce a possible accumulation of red pigment [1].

- 1.3 Add  0.3 mL Methionine 200x solution.


Note

The additional Methionine represses the Met promoter, which drives PP7 syntheses [2].

- 1.4 Add  3 mL SC-XX 10x solution.

Note

In regard to cover all optional dropout media the amino acid base holds the notification - xx, where xx stand for the amino acid(s) that is as selection factor, missing in the medium.

- 1.5 Add  1.5 mL YNB 20x solution (Yeast Nitrogen Base with Ammonium Sulfate without Amino Acids).



- 1.6 Add  0.9 mL ddH₂O.



2 Autoclave for  00:15:00 at  121 °C .

Note

Remove the stirring bar before going to autoclave.

3 When the medium cooled down to around  80 °C add  3 mL sterile Glucose 20%.

4

Note

The medium can be store at the bench for 2 to 3 months.

Protocol references

[1] Kokina, Agnese et al. "Adenine auxotrophy—be aware: some effects of adenine auxotrophy in *Saccharomyces cerevisiae* strain W303-1A." *FEMS yeast research* 14.5 (2014): 697-707.
doi:10.1111/1567-1364.12154

[2] Lari, Azra, et al. "Live-Cell Imaging of mRNP–NPC Interactions in Budding Yeast." *Imaging Gene Expression: Methods and Protocols* (2019): 131-150.
doi.org/10.1007/978-1-4939-9674-2_9