



# ASSIST

AUSTRALIAN SCHOOL SCIENCE  
INFORMATION SUPPORT FOR  
TEACHERS AND TECHNICIANS

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## Mitosis in onion root tip

Posted by Anonymous on Thu, 2017-08-10 11:33

Mitosis in onion root tip: Are there alternative stains for mitosis in root tips please? It needs to be inexpensive (I've been quoted \$150 for 5 gm orcein, including postage), not too hazardous, easy to prepare, and the method of staining not too time consuming.

### Voting:



No votes yet

### Year Level:

7

8

9

10

Senior Secondary

### Laboratory Technicians:

Laboratory Technicians

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## Mitosis in onion root tip

Submitted by sat on 01 September 2017

**Answer reviewed 23/01/2023**

There are a number of different stains available that are suitable for use in the science classroom, including toluidine blue, methylene blue, and aceto-orcein.

## **Toluidine blue**

Toluidine blue is a very effective stain for the visualisation of mitosis in root tips of onions or garlic.

Science ASSIST recommends Toluidine blue as a stain, as it is cheaper and less hazardous than aceto-orcein stain. It has been found to produce a level of contrast within the cells that will allow your students to easily see the chromosomes. It also has a simpler process than Aceto-orcein.

You can find a full procedure for preparing the stain and completing a root tip mitosis practical at [STEM Learning](#).

## **Aceto-orcein**

Aceto-orcein stain is an effective procedure for the visualisation of mitosis in root tips of onions or garlic.

Orcein can be purchased in solid form, the solution is prepared with acetic acid. A full method for stain preparation and procedure can be found at [Mitosis in Growing Root Tips](#).

Alternatively, Aceto-orcein can be purchased as a 1% solution to be used undiluted. Each student group requires one drop of stain, so the prepared stain is cost effective. The cost of the stain and delivery charges vary between suppliers, and is moderately priced.

Aceto-orcein solution is suitable for laboratory use for students in Years 11 and 12.

## **Methylene blue**

Methylene blue will also show mitosis in root tips. It is easy to prepare, and the staining procedure is similar to Toluidine blue

Flinn Scientific has a good procedure for you to follow [here](#).

Science ASSIST recommends you consult the relevant Safety Data Sheet first and our [List of recommended chemicals for science in Australian schools](#) to ascertain the suitability of these stains for your staff and students.

## **References:**

'Mitosis in growing root tips'. Gene Technology Access Centre website.

[https://gtac.edu.au/wp-content/uploads/2016/01/Mitosis\\_Roottips\\_LabPreparation.pdf](https://gtac.edu.au/wp-content/uploads/2016/01/Mitosis_Roottips_LabPreparation.pdf) (Accessed 18 Jan 2023)

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Science ASSIST. 2016. List of recommended chemicals for science in Australian schools.

<https://assist.asta.edu.au/resource/4669/list-recommended-chemicals-science-australian-schools-2021>

STEM Learning. N.d. Microscopy of root tip mitosis. Retrieved (09 January 2023) from STEM Learning website: <https://www.stem.org.uk/resources/elibrary/resource/150333/microscopy-root-tip-mitosis> (Login with a free account)

Making Mitosis Slides (with methylene blue stain solution). Retrieved (23 January 2023) from Flinn Scientific website: <https://www.flinnsci.com/making-mitosis-slides/dc10945/>

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