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Microbiology during COVID-19

Posted by Anonymous on Fri, 2020-05-22 12:19

Microbiology during COVID-19: Are there any additional precautions that should be taken? Science ASSIST has received a few questions on this topic, so we are combining them into one Q&A:

Q1 Should we be getting our students to wear surgical masks, protective eyewear and gloves when using microscopes to view microbes? The microbes relate to the year 12 NESA syllabus for testing microbes in food and water.

Q2 Is it safe to grow bacteria on an agar plate under school laboratory condition in this Covid environment. Have you come across a statement saying that we shouldn't carry out this experiment in school laboratory condition? Is it still safe to carry out this experiment as long as we adhere to all the safety procedures? What will you suggest?

Q3 At the moment, in the current COVID-19 environment, is it okay for students to do pracs involving nutrient agar Petri dishes and inoculating them using swabs from the environment (hard surfaces like light switches, floors etc). Not swabs from the body of course. And I am aware that the Petri dishes would be sealed and would not be opened once incubated. I understand that viruses don't grow in agar, but can they start! if the Petri dish grows some bacteria?? Is this a safe prac do to at the moment?

Voting:



No votes yet

Year Level:

Senior Secondary

Laboratory Technicians:

Laboratory Technicians

Showing 1-2 of 2 Responses

Microbiology during covid19

Submitted by sat on 22 May 2020

Microbiology during COVID-19

A site specific biological risk assessment should be conducted for all microbiological work as recommended in the Science ASSIST [GUIDELINES for best practice for microbiology in Australian schools.](#)

Viruses and their cultivation in the laboratory

There is no risk of the coronavirus growing on agar plates as it will not grow on bacteria and will not be propagated on the agar.

Viruses are unable to be grown on agar plates or in microbiological broths as viruses require a living host cell such as plant or animal cells in order to replicate. Specific cell culture systems or the use of embryonated eggs would normally be required. The exception is Bacteriophages that infect bacteria. These can be grown with bacteria on special agar plates; however these are not used in schools.^{1, 2, 3, 4}

Wearing masks

Masks are not required if you are well and working with standard microbiological procedures, see

- **'How to protect yourself and others from coronavirus (COVID-19)'**, Australian Government Department of Health website, <https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov...> (Accessed May 2020) and the link to the fact sheet **'Information on the use of surgical masks'** <https://www.health.gov.au/sites/default/files/documents/2020/03/coronavi...>
- **'Does wearing a mask help reduce my risk of COVID-19?'** Health Direct website, <https://www.healthdirect.gov.au/coronavirus-covid-19-how-to-avoid-infect...> (Accessed May 2020)

General note: Staff and students should not be at school if they are unwell, so there is no need to wear masks. If disposable masks are used, they must not be reused and must be removed and disposed of properly to avoid increasing risks of infection.

Wearing safety glasses

Safety glasses should be used when conducting microbiological activities including preparing microscope slides to protect from biological splashes and aerosols. They are not required for viewing prepared slides under a microscope, as they may also introduce new risks such as additional face touching.

Shared safety glasses should be cleaned/disinfected between users, see the Science ASSIST Q&As on this topic: [Should shared safety glasses be decontaminated after each use? And safety glasses and assessing risks](#)

Wearing gloves

Gloves are not a substitute for frequent handwashing and can pose a higher risk of spreading disease if not used correctly. See <https://www.safeworkaustralia.gov.au/covid-19-information-workplaces/ind...>

They are not required for standard microbiological procedures unless a person has cuts or other skin problems such as dermatitis.

In the current COVID-19 situation we recommend that gloves are worn if your school chooses to conduct environmental sampling to further minimize risks of infection, see below the section on Environmental sampling.⁴

Note: gloves are not appropriate if using Bunsen burners.

Using microscopes during COVID-19

Microscopes should be cleaned and disinfected in between use. See our question dedicated to this topic at [Disinfecting Microscopes](#)

Isolating microbes from food, water samples and environmental surfaces

Standard microbiological precautions apply, such as those contained in the Science ASSIST [GUIDELINES for best practice for microbiology in Australian schools](#), i.e.

- Sampling can occur with sterile swabs or microbiological loops from
 - various water samples such as tap water, pond water, or flower water from a vase onto nutrient agar.
 - various food samples such as cheeses, yoghurts, fruits or any rotting vegetables onto nutrient agar.
 - suitable environmental surfaces such as laboratory benches, window sills, taps, computer keyboards, light switches and pens or pencils. (See next heading 'Environmental sampling' below for more information)

Note that these agar plates should never be opened or subcultured as they will contain

unknown wild microorganisms some of which may be pathogenic.

- Sampling should never occur from:
 - raw meats, or surfaces used in the preparation of raw meat
 - toilets or unsanitary locations
 - human body fluids
 - skin areas,
 - animal sources
 - soil samples

Environmental sampling

Environmental sampling poses an additional risk during this pandemic, due to the possible presence of the coronavirus on surfaces that are being sampled. I.e. touching something that someone has touched who has the virus.

Therefore, we recommend that gloves be worn by staff/students who are sampling from different environmental surfaces⁴ and the observation of strict safe procedures:

- Do not touch your face whilst wearing the gloves
- Remove gloves correctly without touching the outside of the glove
- Wash hands thoroughly with soap and water or use hand sanitiser afterwards (note washing with soap and water is the preferred method)

Note: Schools have increased their cleaning regime and there may not be many microbes present, however wearing gloves has the additional benefits of

- Providing an additional layer of protection if the current cleaning regime is reduced and we have a second wave of infection
- Providing an additional safeguard of excluding the swab takers microbes

For more information on this activity, see the 'SOP: Microbes are everywhere' contained in Attachment 1 in the [GUIDELINES for best practice for microbiology in Australian schools.](#)

Standard precautions apply as below.

The growth and subculture of pure cultures of microorganisms

Standard microbiological practice should be followed:

Aseptic techniques should be used to avoid generating microbial aerosols which can contaminate agar plates, students or staff, work surfaces and the environment These include:

- washing hands before and after work
- disinfecting benches before and after work,
- covering any cuts on the hands with a waterproof dressing or wearing gloves.

- wearing safety glasses to protect the eyes from any microbial aerosols.
- Using sterile swabs or bacteriological loops,
- working close to a Bunsen flame,
- flaming the mouth of all test tubes and bottles both when the cap is removed and before it is replaced
- opening plates for a minimum amount of time for inoculation
- sterilising all plates in a pressure cooker, or autoclave, at 15psi, 121°C for 20-30 minutes before disposal.

Note: There must be no opening and no subculturing from plates or broths inoculated by students.

Other school requirements:

- Using only a general all- purpose medium such as nutrient agar which does not select for pathogens
- Taping agar plates closed with 4 pieces of sticky tape to prevent opening, but allowing air exchange to generate an aerobic environment.
- After incubation, the plates should **not be reopened** and should be sealed around the whole circumference to reduce the risk of students opening the plates before distribution to students for examination.
- Incubation of cultures between room temperature and 30°C for 24-48hrs.

For more detailed information of microbiology practices, see [GUIDELINES for best practice for microbiology in Australian schools.](#)

Good hygiene during COVID-19

Good hygiene should be strictly observed such as is stated in the Australian Health Protection Principal Committee (AHPPC) statements, see <https://www.health.gov.au/committees-and-groups/australian-health-protec...>

As the information is being frequently updated it is good to check the latest advice. As of (24th April 2020) the latest advice for schools can be found at <https://www.health.gov.au/news/australian-health-protection-principal-co...>

In particular, see the sections on hygiene, routine care and environmental cleaning. The general hygiene advice is:

- Staff and students should stay away from school if unwell
- Everyone should practice good hygiene: wash hands regularly, cough into elbows, minimise touching face
- Clean and disinfect frequently used high touch surfaces and frequently used objects such as computers, photocopiers etc.

Safe Work Australia also has a wealth of good information related to the education and training sector, see <https://www.safeworkaustralia.gov.au/covid-19-information-workplaces/ind...>

References

- ¹ 'Isolation, Culture, and Identification of Viruses', Lumen Learning website, <https://courses.lumenlearning.com/microbiology/chapter/isolation-culture...> (Accessed 22 May 2020)
 - ² 'Personal Study: Virus Culture', Simulab Lab Tech Training Website, <http://simulab.ltt.com.au/4/laboratory/personalstudy/psVirusCulture.htm> (Accessed 22 May 2020)
 - ³ 'Viral Cultivation and Physiology', Houghton Mifflin Harcourt website, <https://www.cliffsnotes.com/study-guides/biology/microbiology/the-viruse...> (Accessed 22 May 2020)
 - ⁴ Lloyd, Megan. 2020. Personal communication. Chair of the Education Special Interest Group of the Australian Society for Microbiology.
- 'Australian Health Protection Principal Committee (AHPPC)' Australian Government Department of Health website, <https://www.health.gov.au/committees-and-groups/australian-health-protec...> (Accessed 22 May 2020)
- 'Disinfecting Microscopes', Science ASSIST Q&A, Science ASSIST website, <https://assist.asta.edu.au/question/4582/disinfecting-microscopes> (21 May 2020)
- 'Does wearing a mask help reduce my risk of COVID-19?' Health Direct website, <https://www.healthdirect.gov.au/coronavirus-covid-19-how-to-avoid-infect...> (Accessed 22 May 2020)
- 'Education and training > General information"', Safe Work Australia website, <https://www.safeworkaustralia.gov.au/covid-19-information-workplaces/ind...> (29 April 2020) (Note: this page has several links to related information and state-based information and advice.)
- 'Good hygiene for coronavirus (COVID-19)', Australian Government Department of Health website, <https://www.health.gov.au/news/health-alerts/novel-coronavirus-2019-ncov...> (Accessed 22 May 2020)
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Submitted by agregory on 26 May 2020

Great responses! Thank you.

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