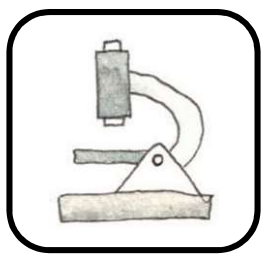
A Key to Common Genera of Slime Moulds

(for kids and beginners)

So you've found a slime mould...

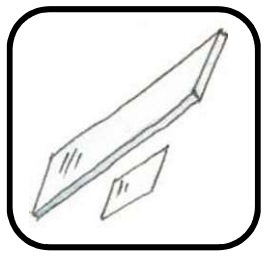
When people find slime moulds, they often want to know what type it is. This can sometimes be hard to figure out because the words in the scientific descriptions are long and confusing for kids.

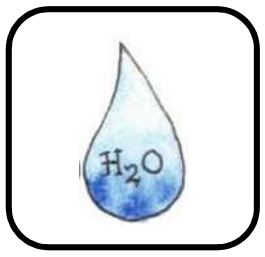
This key covers common groups of slime moulds that you might come across. It doesn't tell you the exact species name of your slime mould, but gets you familiar with the genus groups that exist in this larger group. A genus is a bit like your family name. My name is Peta McDonald, and my family name is 'McDonald'. If you know my last name, then you might know a bit about the people I'm related to, and the things we have in common. It's the same with slime moulds.



You will need

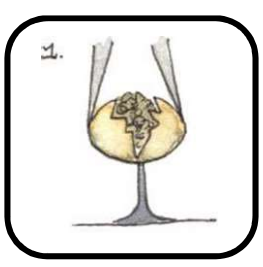
Fine tweezers
Microscope
Glass slides and coverslips
Tiny amount of water

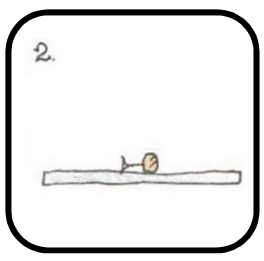


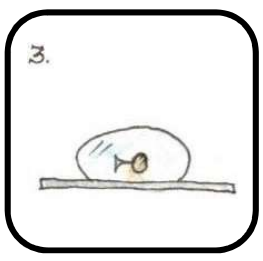


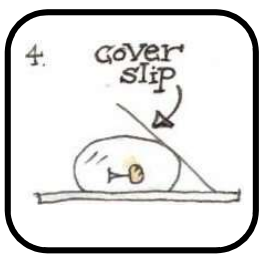
To make a slide

1. Using tweezers, gently crack open a fruiting body of your slime mould and blow out the spores.
2. Place the slime mould on the centre of your glass slide.
3. Put a drop of water on top of the slime mould.
4. Gently lower a cover slip over the drop of water until the slime mould is squashed between the two bits of glass.









Using the Key

For this key, you will usually be given two statements in separate boxes. Read both statements, look at the diagrams and then choose the one that best matches your slime mould. Once you've decided, follow the trail to the boxes below and continue to choose the best one for your specimen.

This is called a Dichotomous key, and by using it, you are practising scientific skills in classification and identification of living things.

Now you're ready to go!

Written and Illustrated by Peta McDonald

Begin by taking a close look at the outside of your slime mould using a magnifying glass or stereo microscope. Then crack one open and prepare a slide for the compound microscope. Let's see if you can figure out what genus it's in!

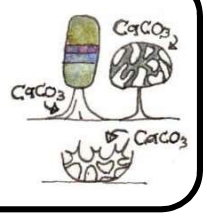
1. Before you use the microscope, have a look at the colour of the spores just using your eyes. If the spores are a dark colour like black, dark brown or purple brown, follow this trail down.

1a. If the spores are a lighter/brighter colour like yellow, orange, red, grey or light brown, then

Go to step 28 on page 3

2. Calcium carbonate ($CaCO_3$) can be found on either the stalk, on the peridium (the skin or case around the spores) or inside the slime mould, holding the spores in place.

(Calcium carbonate ($CaCO_3$) is made of calcium and looks a bit like white chalk or paint or eggshell. Just to make it tricky, sometimes it can be yellow/orange/brownish too).



2a. $CaCO_3$ is not present anywhere on the slime mould.

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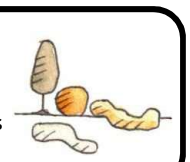
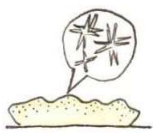
3. Slime mould is shaped a bit like a cushion and is easy to see without a microscope. It can sometimes grow to large sizes.

3a. Slime mould has separate fruiting bodies, some with stalks, some sitting flat (sessile) and others forming worm-like shapes (plasmodiocarps).



4. The outer layer of the slime mould is covered with small crystals of calcium carbonate ($CaCO_3$) that are shaped a little like stars.



Mucilago

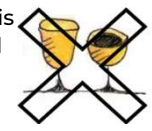
4a. Yellow or white $CaCO_3$ is present on the outer layer and sometimes inside the slime mould as well, but is not in star shapes.

Fuligo

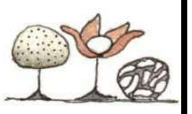
5. Slime mould is cup shaped. The top part of the slime mould has a circular cap like an acorn cap or a lid, which breaks off when it's time for the spores to be released. The bottom part of the peridium (the skin or case around the spores) remains as a deep cup holding the spores.

Craterium

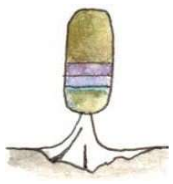
5a. Slime mould is not cup-shaped with a cap.



6. The peridium (the skin or case around the spores) contains calcium carbonate ($CaCO_3$). This sometimes looks like spots of white (or yellow) paint, or sometimes like little salt crystals. At other times, the whole peridium is made of $CaCO_3$ and when you break it, you can see the white colour within like looking at an eggshell or breaking chalk.

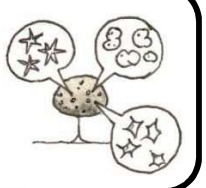


6a. $CaCO_3$ cannot be seen on the peridium but the stalk is made up of white $CaCO_3$. If you snap it, it looks like white chalk inside. The peridium is shiny and colourful, like a hologram.



Diachea

7. $CaCO_3$ on the peridium is in the form of tiny crystals which look like salt or sugar under the microscope. They often sparkle when light is shone on them. They can be star-shaped or disc-shaped and are sometimes are so closely packed that they form a glittery layer, like shell.

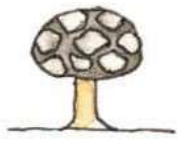


7a. $CaCO_3$ on the peridium is not made of little crystals.

8. $CaCO_3$ crystals appear to be sprinkled over the peridium like dust, or sometimes joined together in a shell-like layer.

Didymium

8a. $CaCO_3$ crystals look like flat scales which are stuck on the peridium.

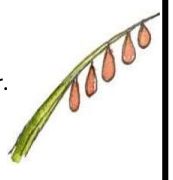


Lepidoderma

9. The $CaCO_3$ on the peridium makes a layer like eggshell. It is smooth, and sometimes shiny. It is made of tiny, spherical balls of $CaCO_3$ which can be seen under the microscope.

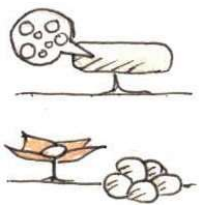
9a. The $CaCO_3$ on the peridium looks more like spots of paint. It can be white, yellow, orange, red or sometimes even pink.

10. Slime mould is egg-shaped or tear-drop shaped and is shiny, yellowish brown to chestnut brown in colour. There is $CaCO_3$ inside if you crack it open.



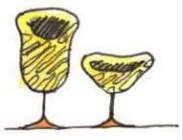
Leocarpus

10a. Slime mould is a different shape to above. The peridium is made of tiny, spherical (circle shaped) balls of $CaCO_3$ which can be seen under the microscope. The peridium cracks a bit like eggshell when you break it.



Diderma

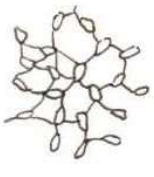
11. Slime mould has a stalk and is the shape of a deep bowl or little bucket. The peridium is covered with patches of yellow $CaCO_3$ which is rough. If cracked open, small white, $CaCO_3$ spikes can be seen between the spores.



Physarella

11a. Slime mould is some other shape but also contains white or yellow $CaCO_3$ on the inside when cracked open.

12. When cracked open, a web-like structure can be seen holding the spores, with small pieces of $CaCO_3$ scattered about. At times, the $CaCO_3$ is in ball shapes, at others, it is has pointy parts sticking out, these are called calcium carbonate 'nodes'. The nodes are usually connected together by very fine, clear tubes which look a bit like fishing wire.

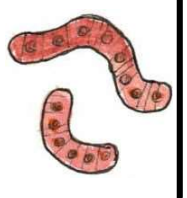


Physarum

12a. When cracked open, a solid white, branch-like structure can be seen inside holding the spores. This is called the capillitium and is made of $CaCO_3$. There are parts that are thickened and then parts that are thin, like tiny white branches.

Badhamia

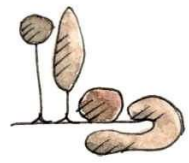
12b. Slime mould is shaped like a worm or sausage (plasmodiocarp). The plasmodiocarps can be short or long, have yellow, orange or red $CaCO_3$ on the peridium and dark red spots along their length. Inside, are yellow $CaCO_3$ plates, surrounded by the dark brown spores.



Willkommlangea

13. Slime mould is shaped a bit like a cushion or the separate fruiting bodies are very tightly packed and joined together at the bottom so they grow like tufts.

13a. Slime mould has separate fruiting bodies, sometimes with stalks, sometimes sitting flat (sessile) and others forming, worm-like shapes (plasmodiocarps). At times these can be crowded together but are not usually joined at the base.

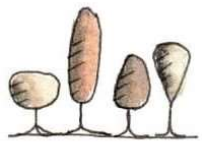


14. Slime mould has individual fruiting bodies which are attached at the base. From above, you can see the separate parts growing out like a sea sponge or coral.

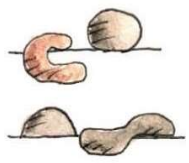
Symphytocarpus

14a. Slime mould is more of a cushion shape, with no separate fruiting bodies.

16. Slime mould has a stalk and can be many shapes from a sphere, to egg-shaped, to a cylinder.



16a. Slime mould sits flat on the substrate (sessile) and can be either a sphere shape, angular or can be longer like a worm or sausage.



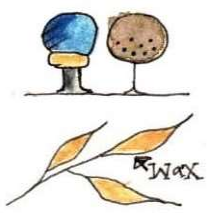
15. The capillitium (branches inside the slime mould that hold the spores) is composed of thin threads which contain thickened sections that look like a group of bubbles attached together.

Brefeldia

15a. Branches of the capillitium without thickened sections.

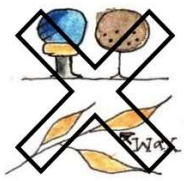
Amaurochaete

17. The slime mould contains a yellow waxy substance either on the stalk like a yellow collar, as oil spots on the peridium (the skin or case around the spores) or on the inside, as part of the capillitium (branches inside the slime mould that hold the spores). Under the microscope, this waxy substance looks like yellow drops of oil.

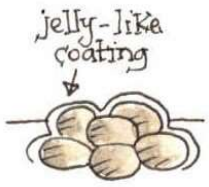


Elaeomyxa

17a. There is no wax on the slime mould.



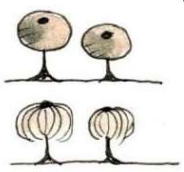
26. Slime mould is very slimy and jelly-like when moist.



Colloderma

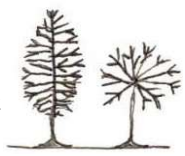
26a. Slime mould is not jelly-like when moist. The peridium is thin like cellophane that gleams with beautiful colours.

18. Slime mould is a ball shape and has a small, black disc on the top of it. If the spores are blown away, you can see that the capillitium (branches inside the slime mould) is sometimes connected to this disc and hangs down to hold the spores.

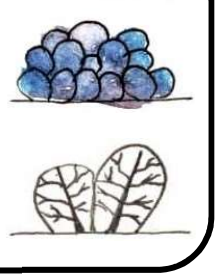


Enerthenema

18a. Slime mould without a black disc on top, capillitium inside the slime mould grow out from the main stalk to hold the spores.

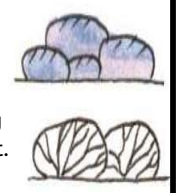


27. While there is no stalk, there is a columella (which is like a stalk but on the inside of the slime mould). The capillitium extends from all along the columella and the branches link to each other amongst the spores.



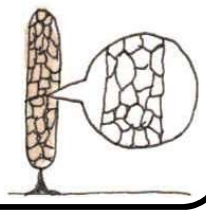
Paradiachea

27a. There is no columella. The capillitium joins from the base of the slime mould to the top occasionally attaching to each other like a net.

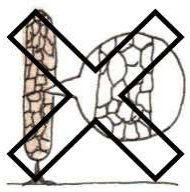


Diacheopsis

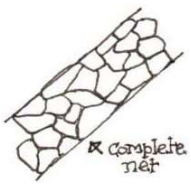
19. When spores are blown away, the capillitium forms a very fine net which can be seen all over the surface of the slime mould. This is connected to the stalk.



19a. No net can be seen over the surface of the slime mould when the spores are blown away.

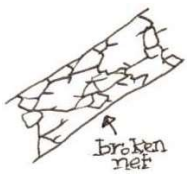


20. The net is very well developed without many breaks, and the slime moulds mostly grow clustered together in tufts. They are usually tall and cylinder shaped.



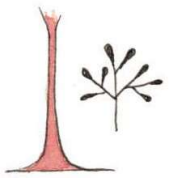
Stemonitis

20a. The net has some breaks and holes in it, but can still be seen as a net. The slime moulds grow more loosely in clusters, and seem to stand apart from each other more than in Stemonitis. While they are also usually cylinder shaped, they are often a bit fatter and have a more rounded look at the top.



Stemonitopsis

21. Slime moulds very small, usually less than 1mm tall. The ends of the branches are sometimes a bit thickened or club-shaped, and the stalk can sometimes be a translucent red colour when viewed under the microscope (this means you can see through it).



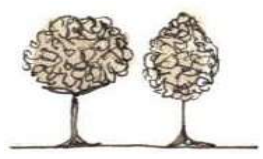
Paradiacheopsis & Macbrideola

21a. Slime mould larger and not as described in Step 21.

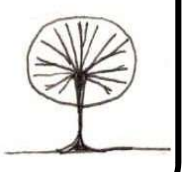
22. The outer skin around the spores (peridium) tends to stay attached even when the slime mould splits open to release the spores. It can look a bit like cellophane and is sometimes beautifully coloured.

22a. The peridium breaks down and disappears once the slime mould matures. Sometimes a tiny piece of it might remain attached to the top of the stalk like a small collar.

Go to step 24 on page 3

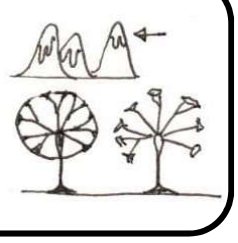


23. The capillitium (branches inside the slime mould) is not tightly attached to the peridium (outer skin layer). The peridium lasts for a long time.



Lamproderma

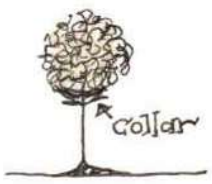
23a. The capillitium is tightly attached to the peridium. The ends of the branches are often shaped like a tiny funnel and when the slime mould breaks open, the peridium breaks into small flakes which stay attached to the ends of the branches. These slime moulds are only found in areas where there is snow around for part of the year.



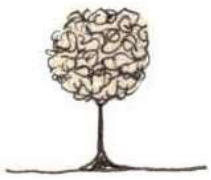
Meriderma

24. Peridium leaves a small collar around the stalk.

Collaria



24a. Peridium completely disappears and there is no collar left around the stalk.

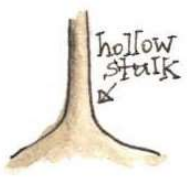


25. The stalk is fibrous and the base looks a bit like thick string under the microscope. You can't see through the stalk.

Comatricha

25a. The stalk is hollow and sometimes translucent (you can see through it) under the microscope. It does not look fibrous at the base.

Stemonaria



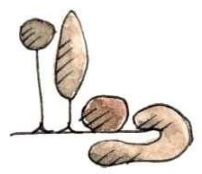
---Note to Kids---

There are a few species that have brown spores but belong to a different genus, so if you can't find your specimen here, then move on to the list of the species with brighter/lighter coloured spores below!

1a. Spores are a lighter/brighter colour like yellow, orange, red, grey or light brown.

28. Slime mould can sometimes be quite large and is usually easy to see without a microscope. It is shaped a bit like a cushion or the separate fruiting bodies are very tightly packed and joined together at the bottom so they grow in tight clusters.

28a. Slime mould is smaller and has separate fruiting bodies. Sometimes these have stalks, sometimes they sit flat (sessile) and others form, worm-like shapes (plasmodiocarps). At times these can be crowded together but are not usually joined at the base.

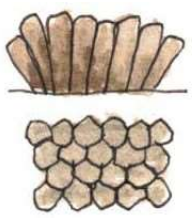


29. From above, the slime mould appears to be made of separate parts, growing together in a tight cluster.

29a. The slime mould is cushion-shaped with no trace of separate parts when viewed from above.

30. The slime mould is cushion shaped or in a tight cluster like a bunch of flowers. The separate parts sometimes look like hexagons from the top. Usually they have free tips from each other. The spores are coloured like cinnamon or rust.

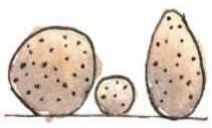
Tubifera



30a. The slime mould is flattened, like glue spilt on a table. (See also Dianema)

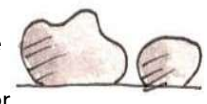
32. Slime mould looks like spheres, eggs or is sometimes cushion shaped. The spores are very pale pink or pale grey in colour.

Lycogala



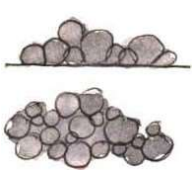
32a. Slime mould is more cushion shaped with a wide base. The spores are brown, yellow or olive coloured.

Reticularia



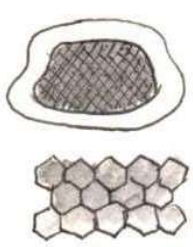
31a. The separate parts are usually in very tight groups, with their walls often joined to each other, it can appear like a pile of bubbles.

Lindbladia



31. Individual parts are only seen as flat hexagons on the surface. Often there is a shiny, white layer found underneath the slime mould which comes out onto the substrate from the sides (this is actually a little bit like a glue that holds it to the wood).

Dictydiaethalium



33. Slime mould is very tiny, smaller than usual (approximately 0.1-0.8mm tall) and always has a stalk. It is so small that it can be hard to see, even under a stereo microscope. Spores are white, pale pink or pale yellow.

Echinostelium

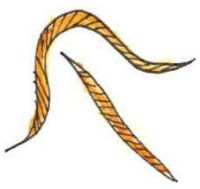
33a. Slime mould larger than in step 33 and spores with brighter colours.

Go to step 34 on page 4

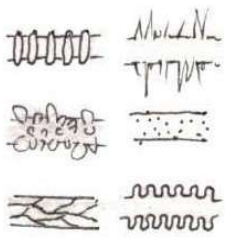
34. There are threads, hair-like branches or tubes inside the slime mould in amongst the spores. They help to hold the spores in place. This is called capillitium.

34a. There is no capillitium inside the slime mould to hold the spores.

36. Capillitium is covered in a spiral pattern, a bit like a piece of rope or string. Sometimes the spirals are tightly packed together like a string wound very tightly, at other times, they are loose or further apart.

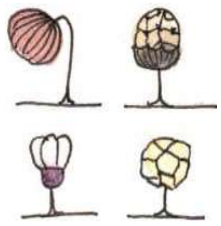


36a. Capillitium is not patterned with spirals. It is instead either smooth, or covered in spines, rings, warts or knobbly bits.



35. A cage or net-like structure can be found around the outside of the spores, but no capillitium (branches or threads) is inside the slime mould.

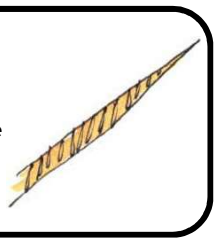
Cribraria



35a. There is neither capillitium, nor a cage like structure around the spores. The slime mould usually grows flat on the surface but sometimes has a very short, wide stalk.

Licea

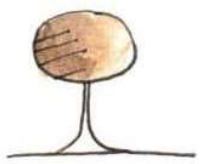
37. Spirals are very clear on the capillitium.



37a. Spirals are very weakly marked on the capillitium, and the strands have rounded or blunt ends.

Oligonema & Calonema

41. Slime mould has a stalk.



41a. Slime mould sits flat on the substrate (sessile).

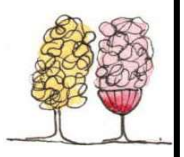
38. Capillitium is attached to the slime mould at the base. It stays attached if you crack it open and blow out the spores. The ends of the capillitium split into strands like a piece of rope that has unravelled.

Prototrichia

38a. Capillitium is not attached to the base, but is loose and falls out of the slime mould if you crack it open.

42. The slime mould looks a bit like fairy floss on a stick. Capillitium is swirly and all seems to connect to itself. The strands are covered in lots of interesting patterns like rings, spines, small ridges or warty/knobbly bits. This genus comes in many colours, like white, yellow, pink, red.

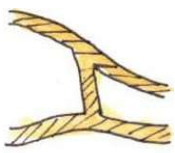
Arcyria



42a. Capillitium different from that described in step 42.

39. The thread-like capillitium appears to be all joined together into a net so that there are not many free ends to be seen.

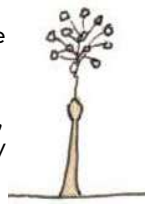
Hemitrichia



39a. There are many separate strands of capillitium and many pointed ends can be seen.

43. Slime mould is spherical in shape and is smaller than 2mm. The capillitium branches like a tree from the top of the stalk to the peridium (the skin or case around the spores). When fully developed, the peridium breaks apart into tiny flakes that stay attached to the tips of the capillitium.

Clastoderma

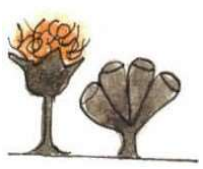


43a. Slime mould is egg shaped, growing in clusters, sometimes with stalks that are joined together. If there is capillitium, it is made of straight tubes growing in tufts which look like the bristles on a brush. Otherwise, there may be no capillitium at all.

Alwisia

40. Peridium (the skin or case around the spores) is quite thick or hardened and often black in colour. Some open by a lid, and others crack open like rough petals. Spores are an orange/yellow colour or brick red.

Metatrichia



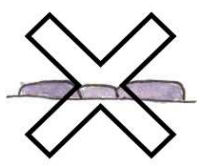
40a. Peridium is more like a membrane or a thin skin, although a few species have a thicker layer on the outside and break apart like little plates on the surface. Spores usually yellow/orange coloured.

Trichia

44. Slime mould looks like flat cushions crowded together, each separate part smooth. Spores pale grey, sometimes with a purple tinge.

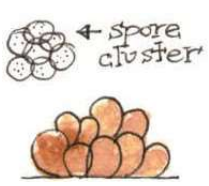
Dianema

44a. Slime mould different from description in step 44.

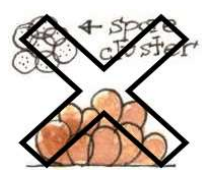


45. Slime mould fruiting bodies are found in small, heaped piles. Spores are dull red in colour, and under the microscope can be seen clustered in little groups.

Minakatella



45a. Slime mould fruiting bodies not heaped in piles and spores a different colour.

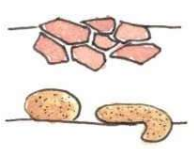


46. The peridium is like a thin membrane or skin around the spores. While the slime mould is usually orange or light beige, the peridium can sometimes be shiny and reflect colours like a hologram. Spores are pinkish-grey or pale yellow.

Calomyxa

46a. The peridium is usually some shade of yellow to dark red or black and is thicker than described in step 46. Spores are bright or golden yellow.

Perichaena



Hopefully, you now have some ideas about which genus your slime mould might fit into.
It's a good idea to write them down and then explore each one a bit further to see if the descriptions match your slime mould. This is what scientists do when they identify many different types of living things.
You're never too young to have a try yourself!

If you want a further challenge, you could find a key that helps you narrow down which species you have within this genus.

All the best with your searching and identifying!

Peta

(Science Teacher in Melbourne, Australia)
Contact me at **peas3@hotmail.com**

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