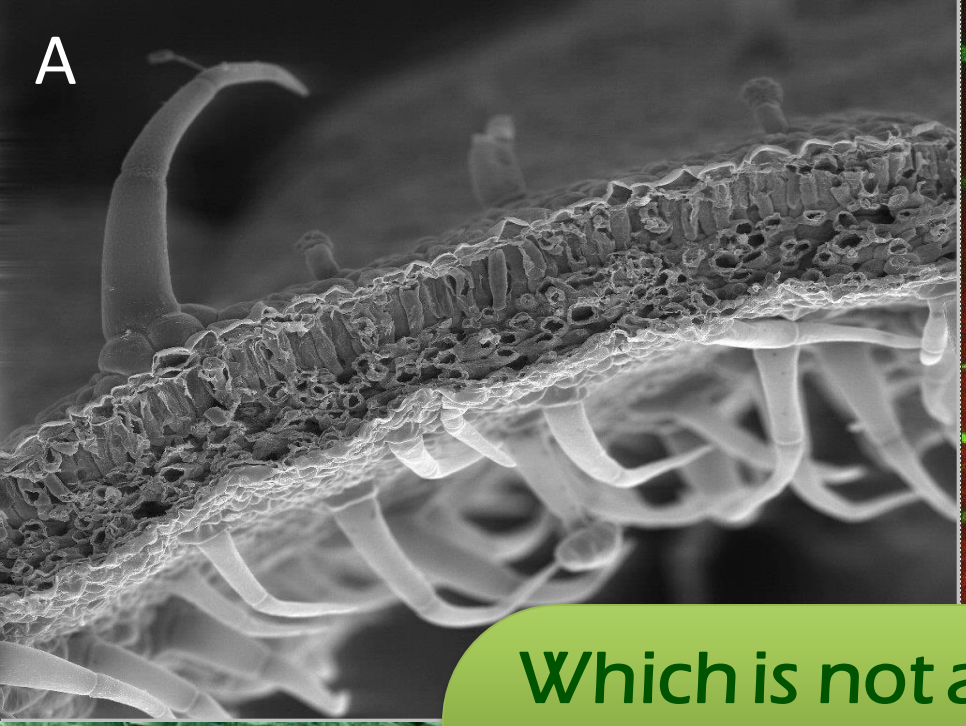
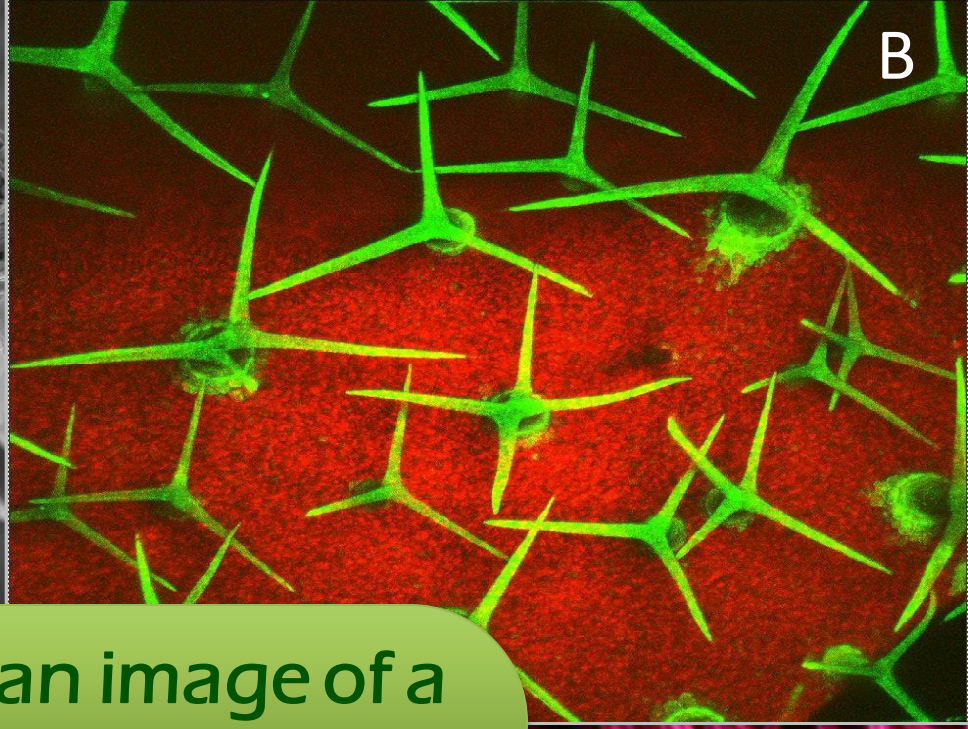
Fascinating plant microscopy quiz

Plants have some amazing and beautiful structures that can only be seen down the microscope. Can you identify the plant structures in the following pages?

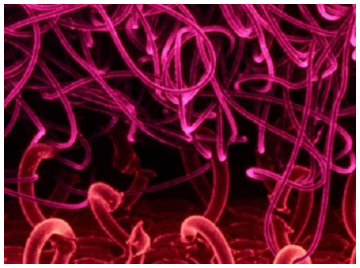




Which is not an image of a plant?

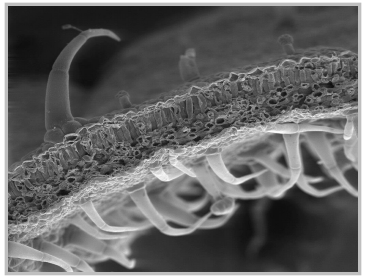
Plant trichomes or hairs have many functions including protection against insect attack and water loss

D

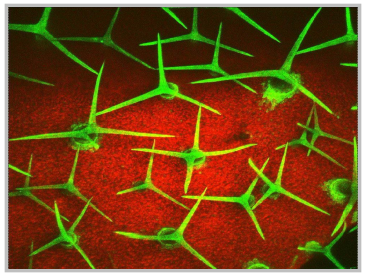


Microscopic image of Velcro

Velcro.com. Photo: Breger Dee/Getty Images/Science Source



Microscopic image of a section through a tomato leaf. There are different types of trichome on each side of the leaf.



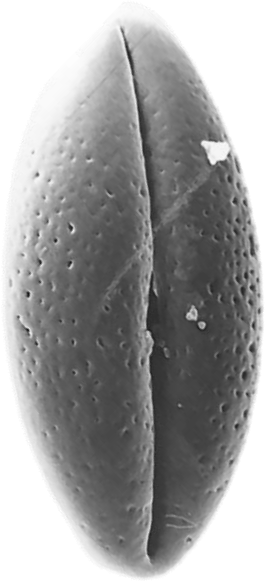
Coloured microscopic image of the surface of an Arabidopsis leaf. Damage to the spiky trichomes provides the plant with an early warning of insect attack.

Microscopic image of the surface of an nettle leaf. If the leaf is touched, the trichomes break and release nasty chemicals to irritate the skin.

A

B

C

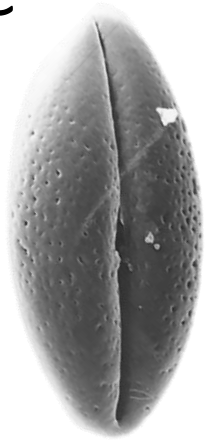


D

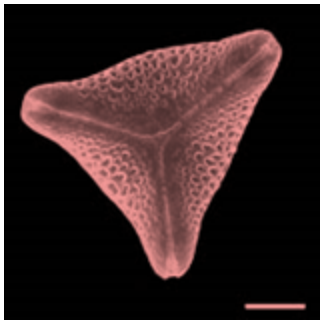
Which is an image of a pollen grain?

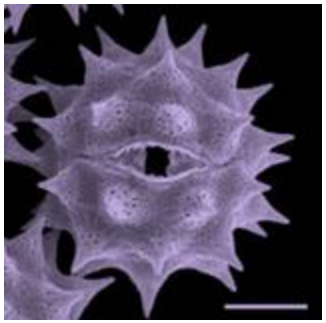
Pollen grains have an elaborate coating called the exine

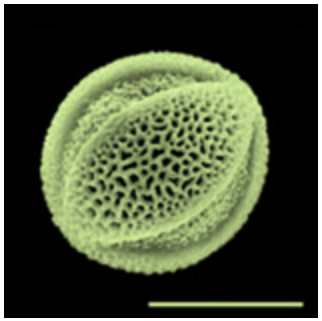
C



Scanning electron microscope image of a tobacco pollen grain. The groove down the centre is where the pollen tube emerges after the grain lands on the flower stigma. Pollen shapes and textures are many and varied. Plant species can be identified by their pollen. A few examples are shown below (https://askabiologist.asu.edu/images/zoom/pollen-gallery-pollen-close).

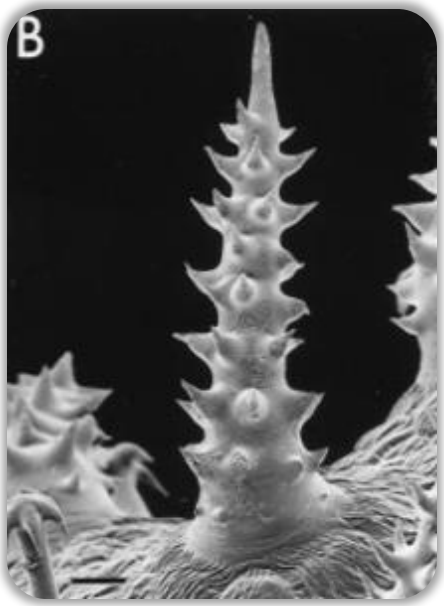


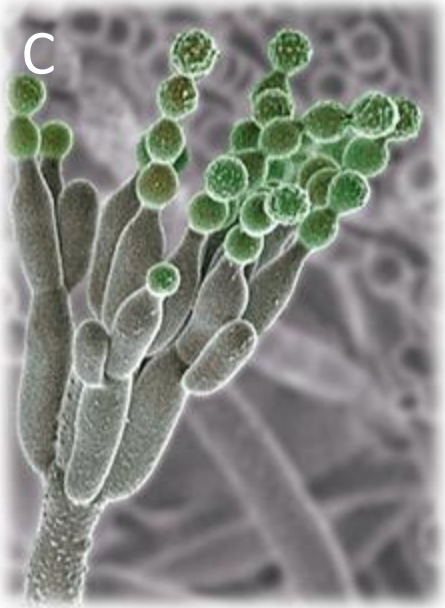




Bread roll

Natural sponges





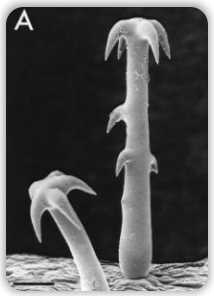
Which is not an image of a plant?

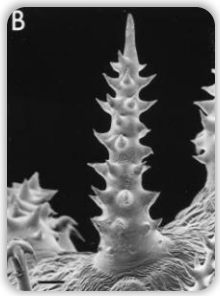
Trichomes can be lethal

C

Image C shows a fungal conidia with chains of spores

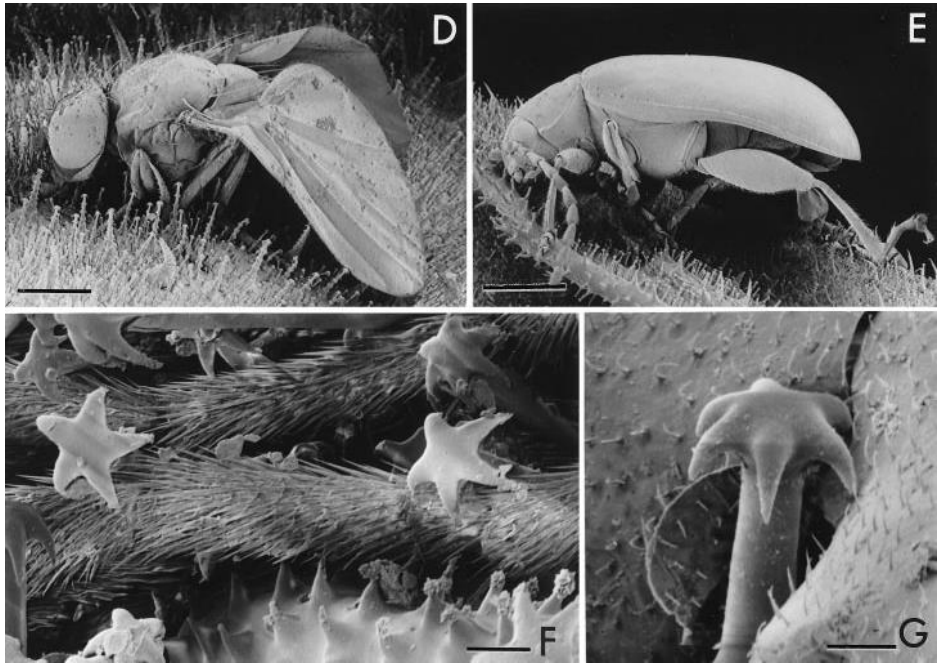
M. R. Van Leeuwen, T. M. Van Doorn, E. A. Golovina, J. Stark, J. Dijksterhuis
Applied and Environmental Microbiology Dec 2009, 76 (1) 366-369; **DOI:** 10.1128/AEM.01632-09



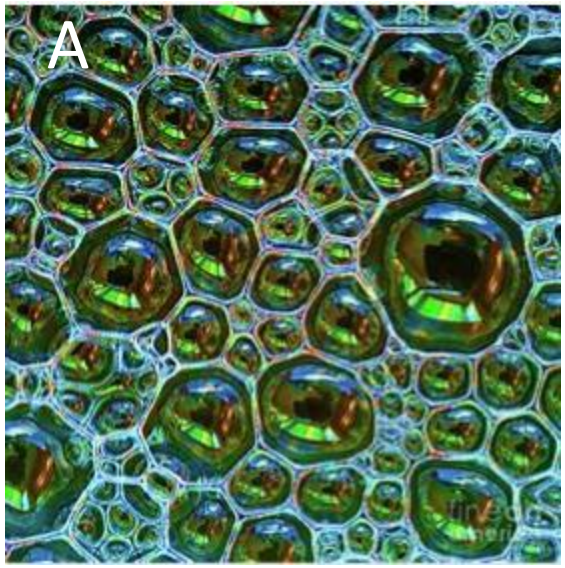


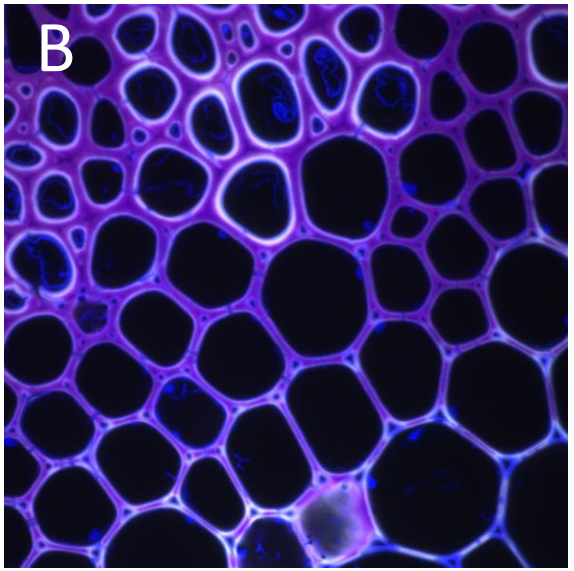
These are images of plant trichomes

Mentzelia pumila trichomes trap insects



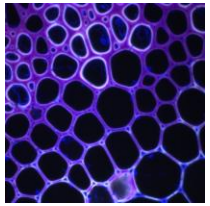
Eisner, T., *et al*., (1998). *Proc. Natl. Acad. Sci. USA* **95:** 4410-4414.



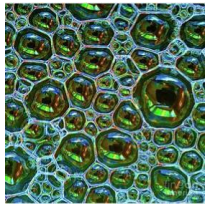


Soap or stem, which is the plant tissue?

These kinds of self-assembly shapes appear many times in nature.

B 

Confocal microscope image showing section through a stem. Efficient space filling plant cells



Bubbles: efficient space filling

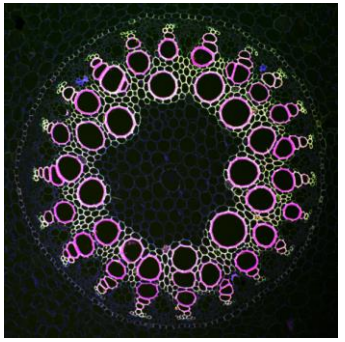
Other examples of self assembly in nature

Pollen grain: wall structure formed through physiochemical processes

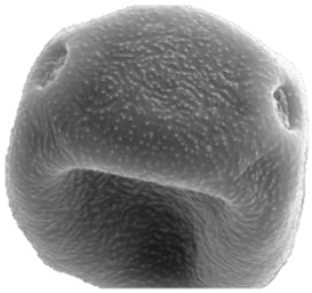
Honey comb: efficient space filling wall structure

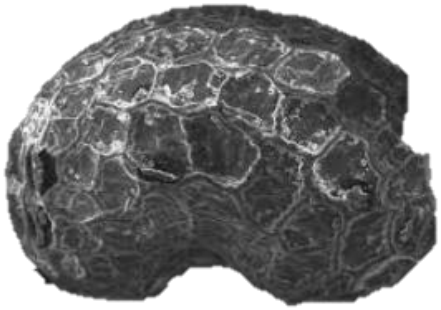
More, beautiful microscope images of plants can be found at the web site below

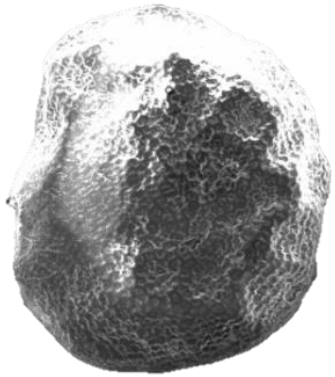
https://haseloff.plantsci.cam.ac.uk/imaging/index.html



A B C D



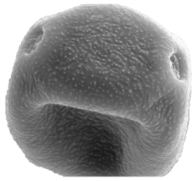




Which is not an image of a seed?

Although very different in size, pollen and seeds share many features

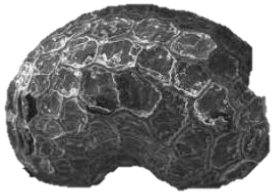
A



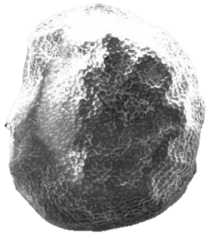
A scanning electron microscope image of Alder pollen

Images B, C and D are seeds

Kadua seed



Poppy seed



Datura stramonium (thorn apple) seed

Both are dehydrated structures with very resistant coatings