

Freshwater Cyanobacteria Identification

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Morphology 1:

Chroococcales & Synechococcales

cells round, oval,
spheres, etc.

single cells or
colonies

how are they arranged:
touching, spaced out

mucilage? and its
appearance

cells round, oval, spheres, etc.

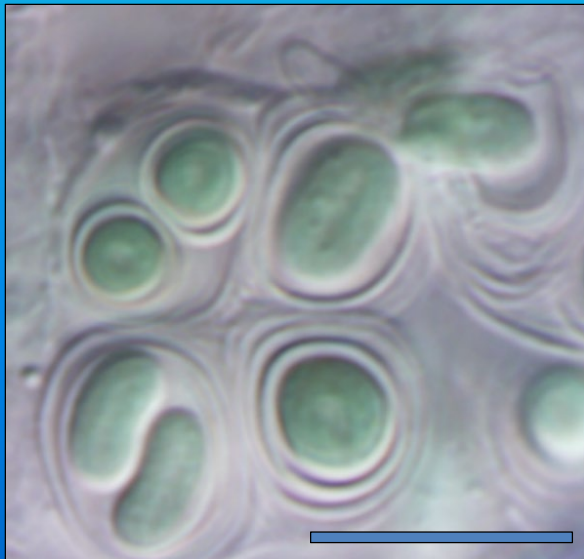
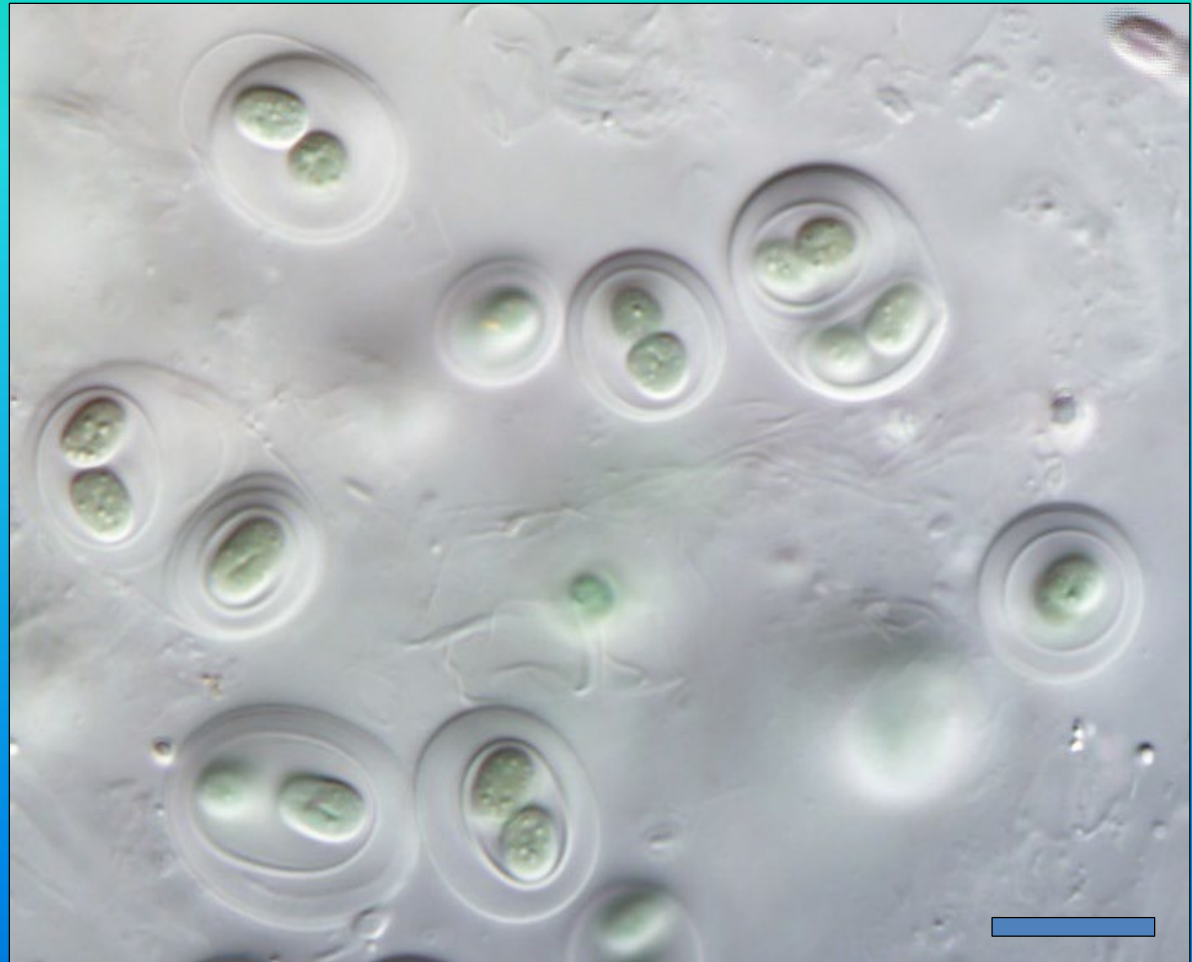
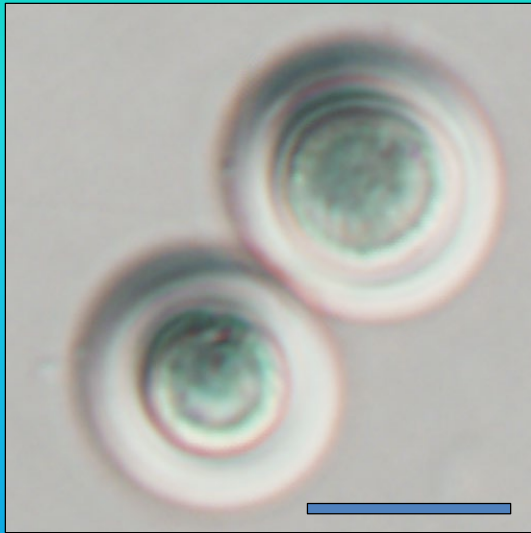


Geminocystis



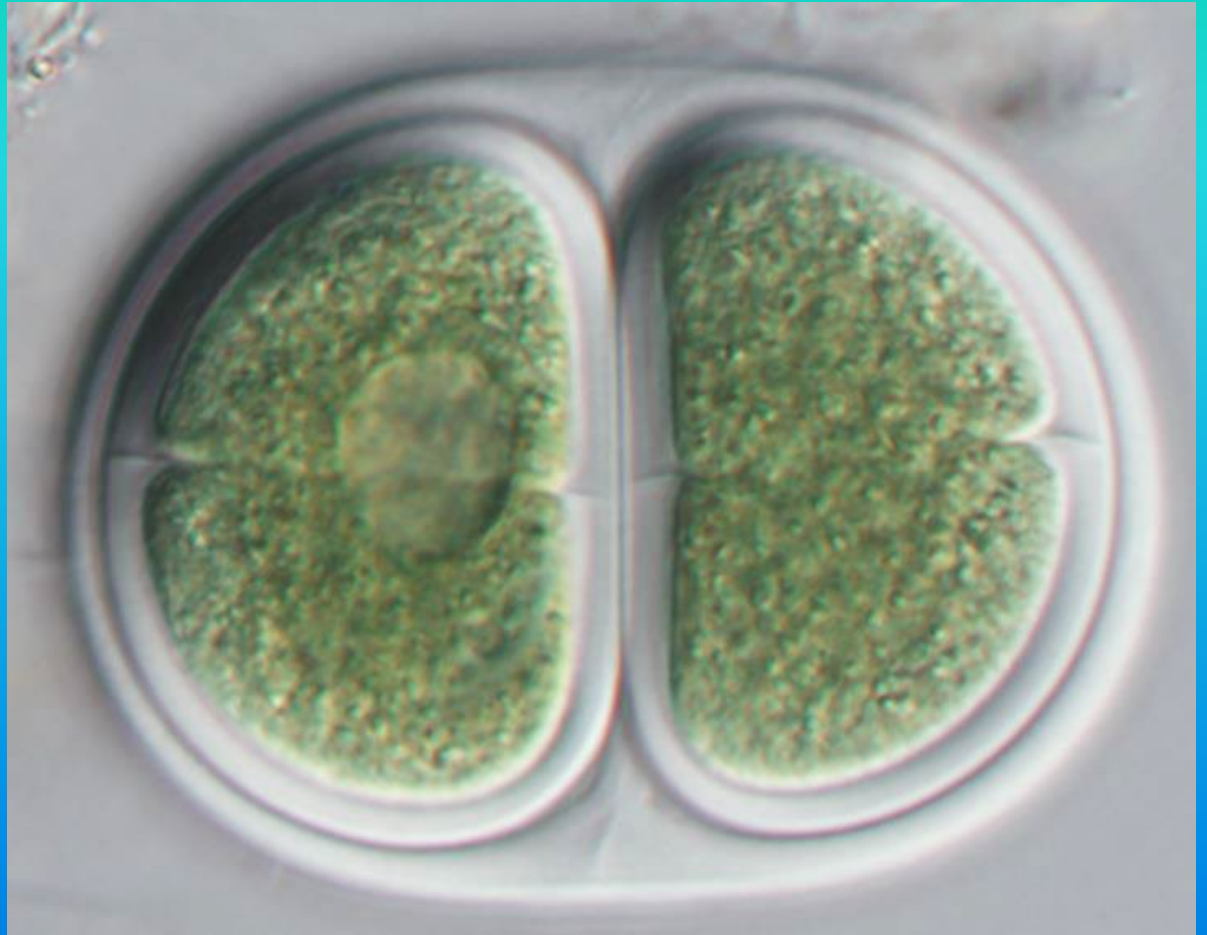
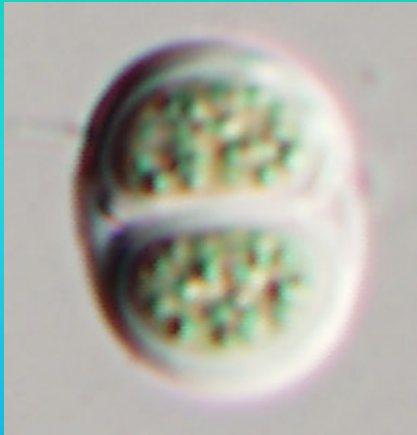
Halothece or *Cyanothece* or *Cyanobacterium*
sp. Bar is 10 μm in length

cells round, oval, spheres, plus mucilage



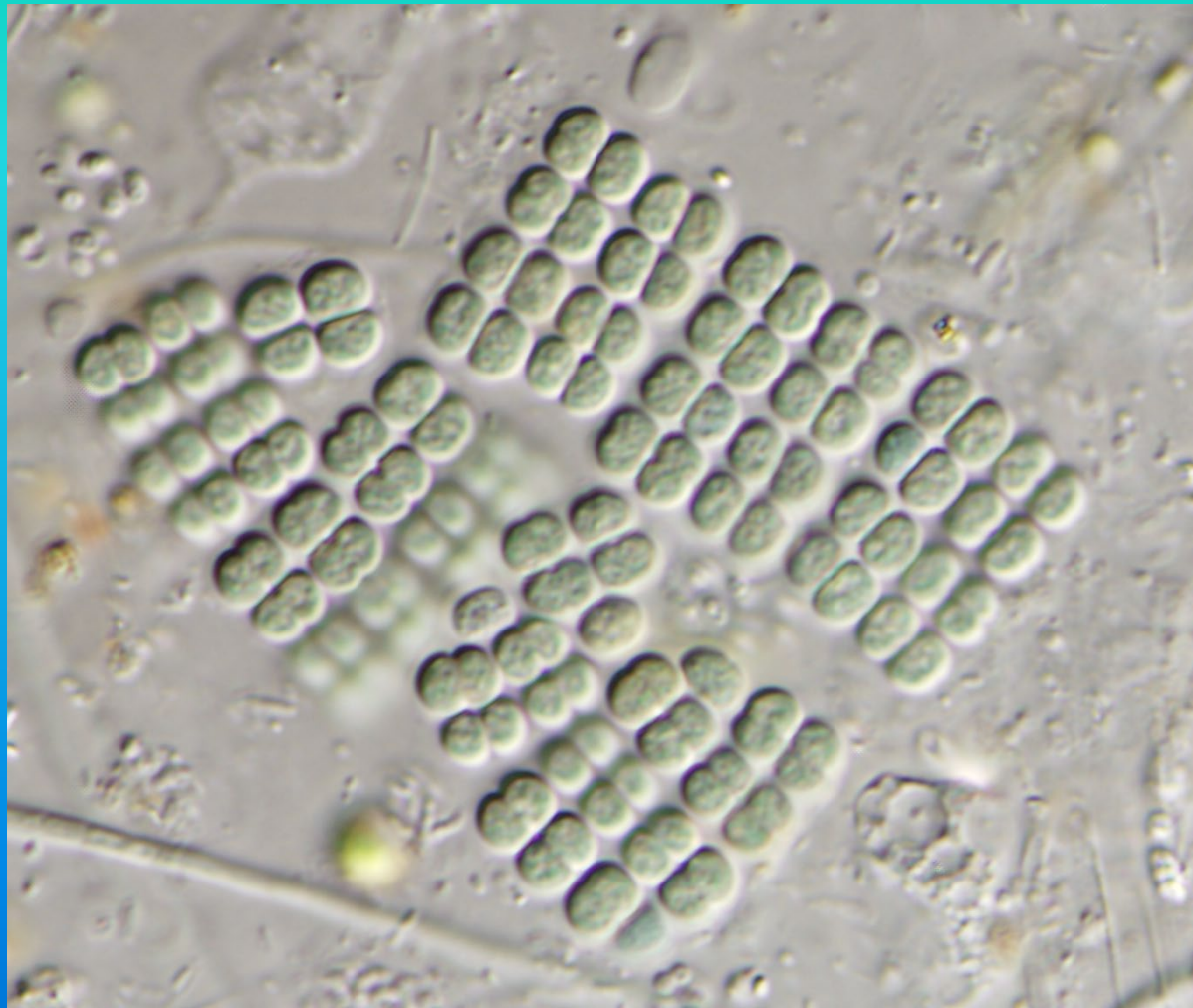
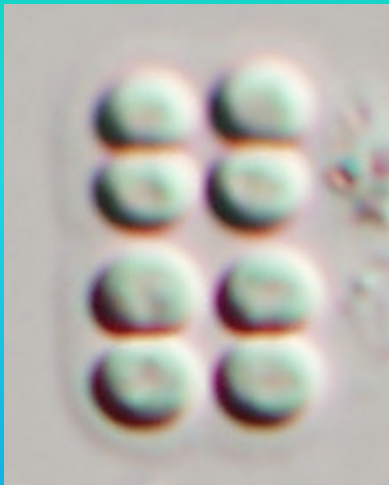
Gloeotheca interspersa. Bar is 10 μ m in length.

cells round, oval, spheres, plus mucilage



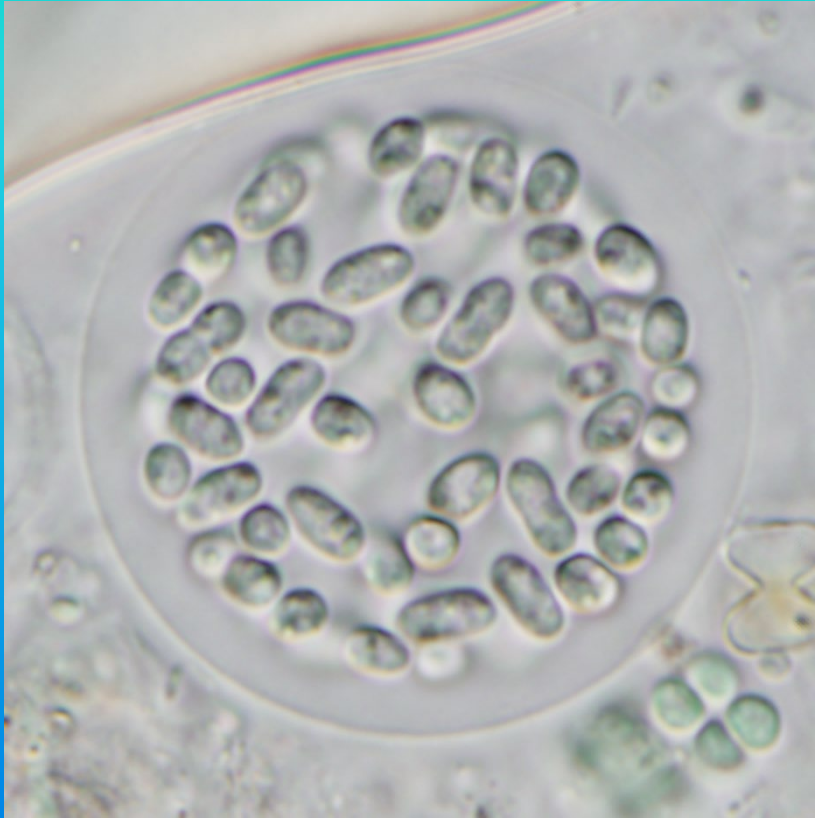
Chroococcus

cells round, oval, spheres, plus mucilage



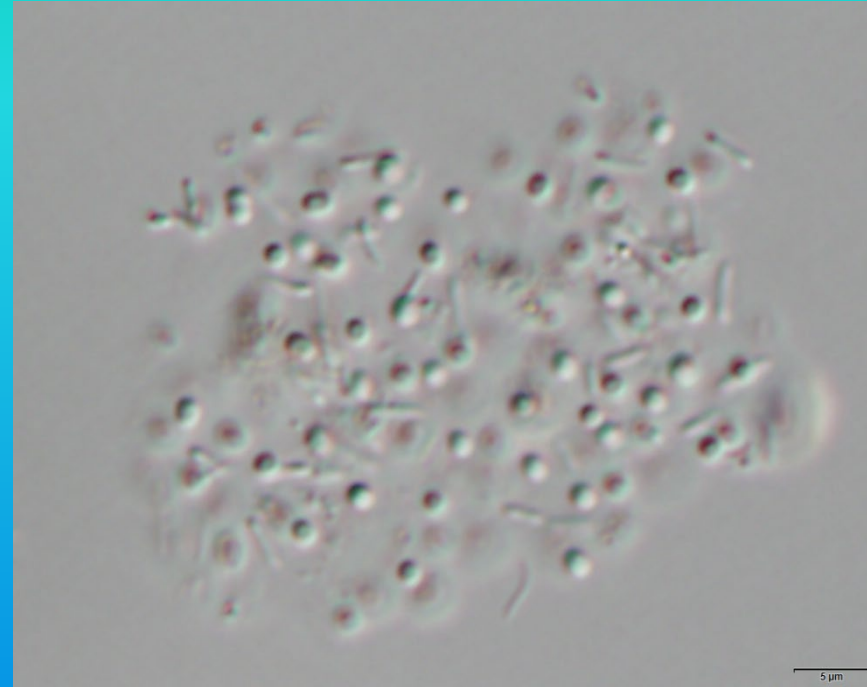
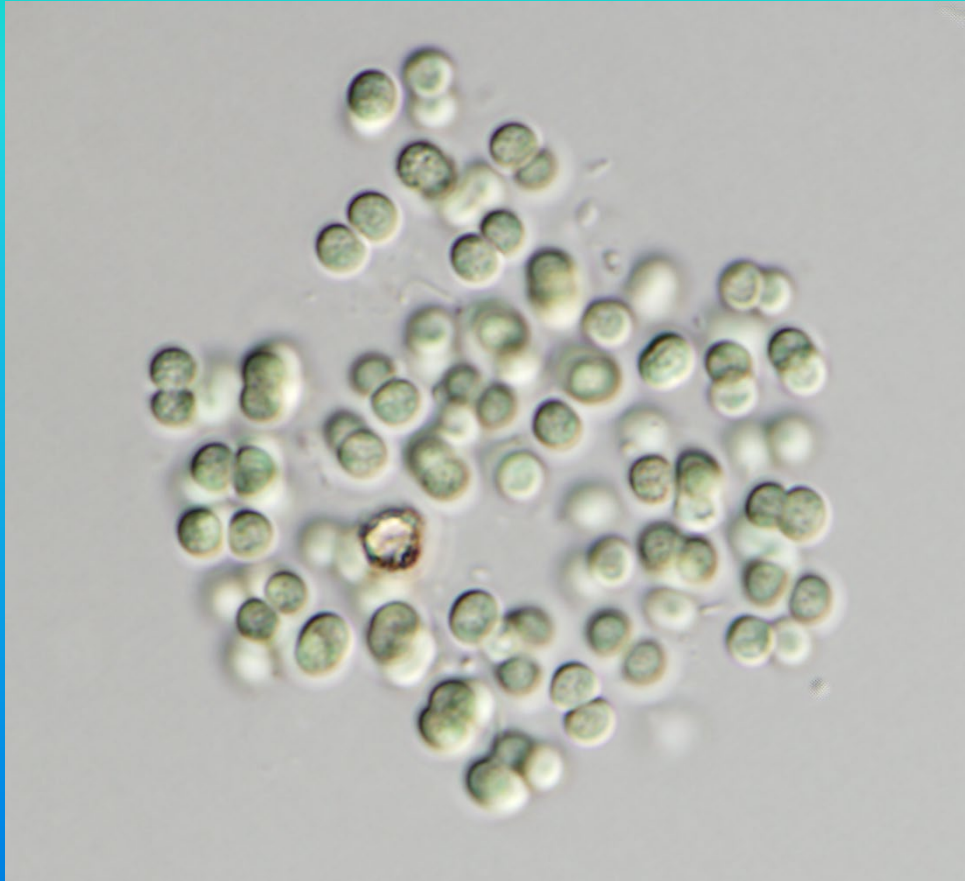
Merismopedia

cells round, oval, spheres, plus mucilage,
plus colonies-loose vs. tightly packed



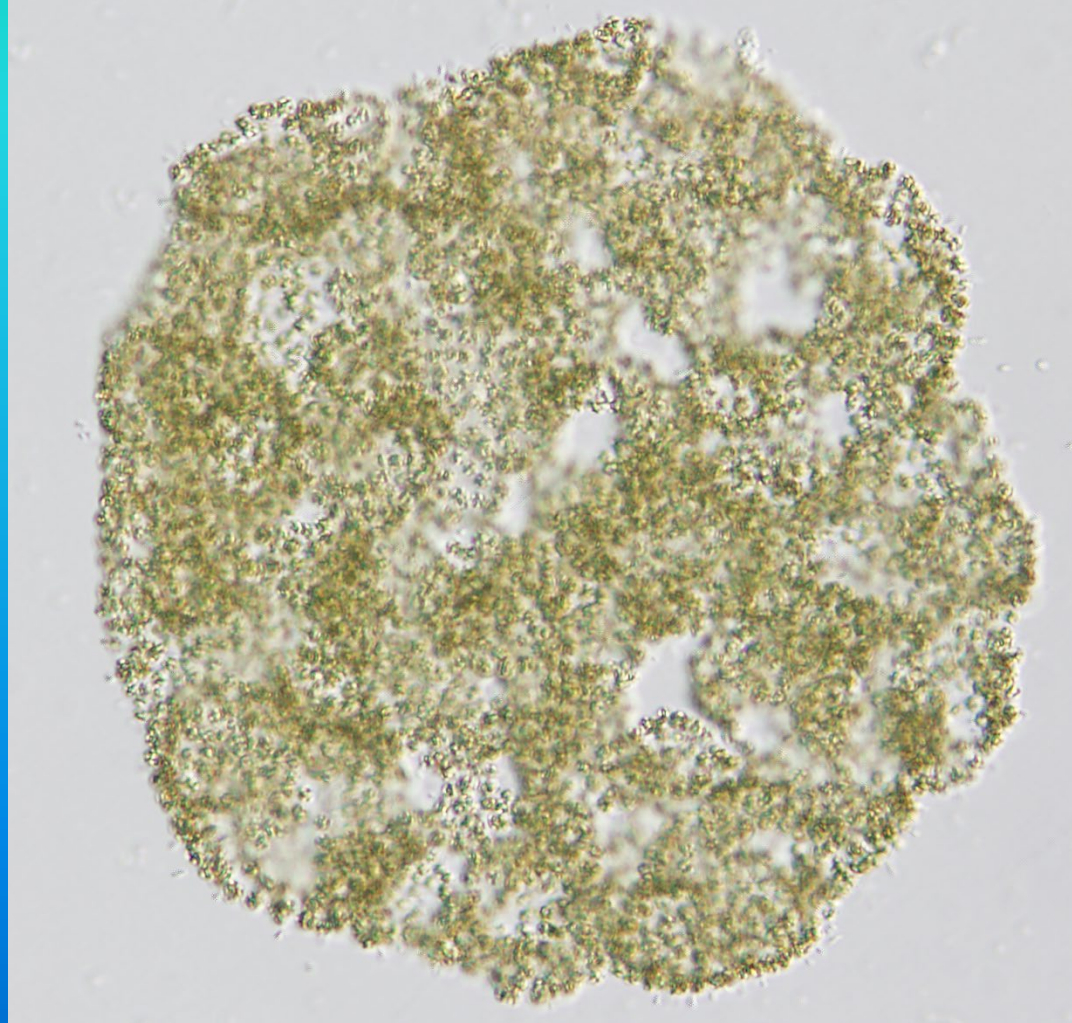
Aphanothece

cells round, oval, spheres, plus mucilage,
plus colonies-loose vs. tightly packed



Aphanocapsa

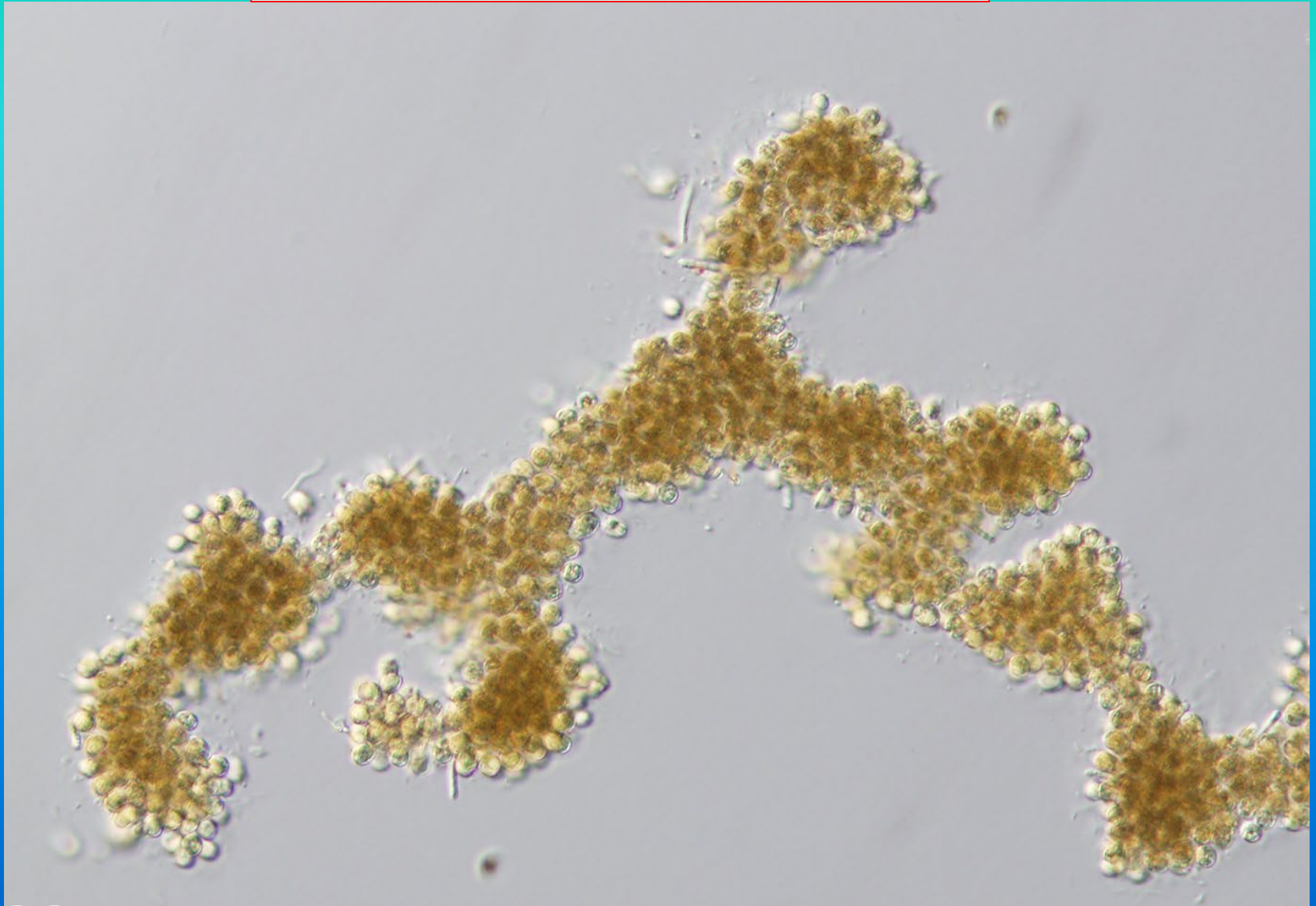
Microcystis- *colony*



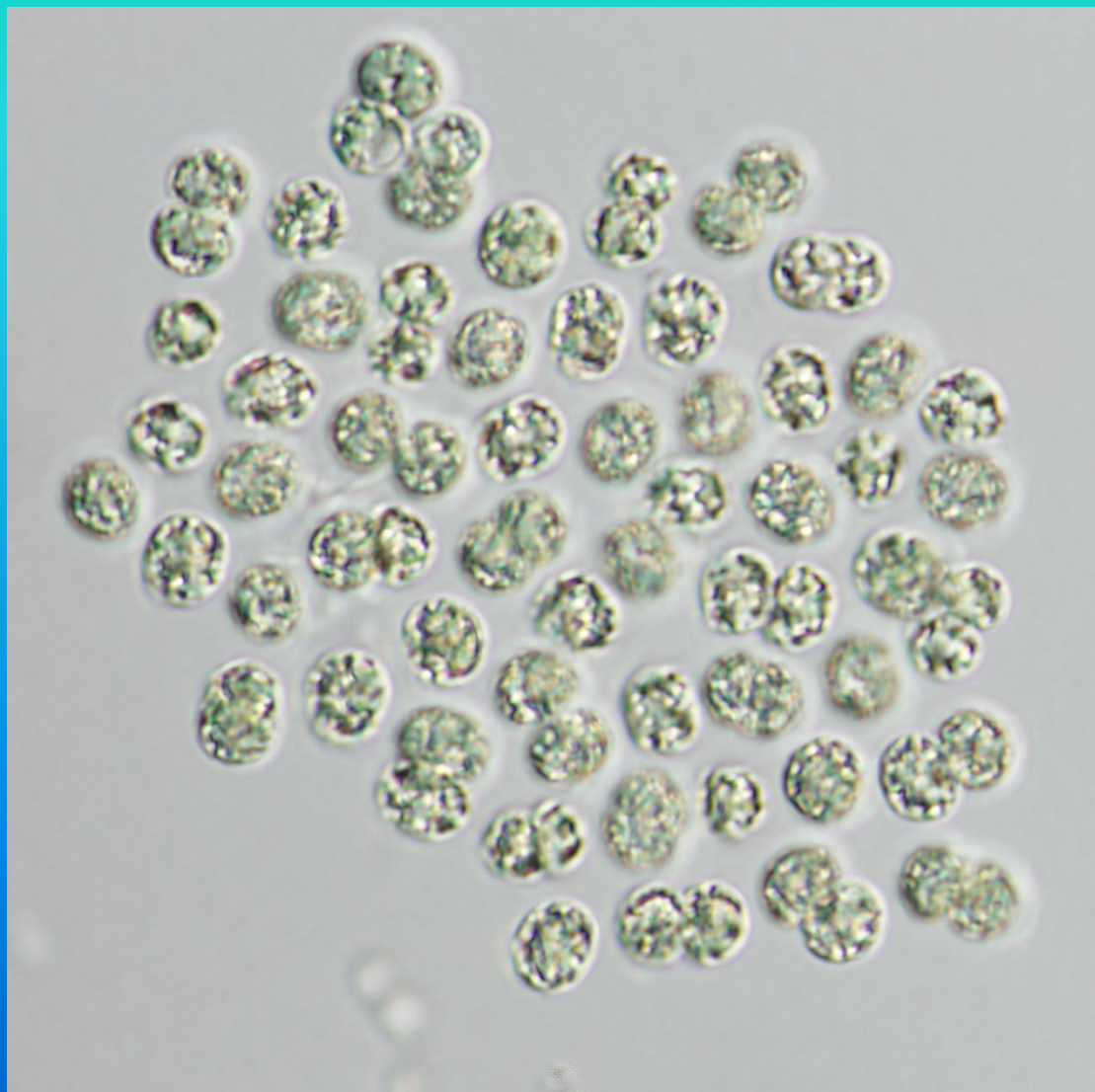
Microcystis aeruginosa- colony variation



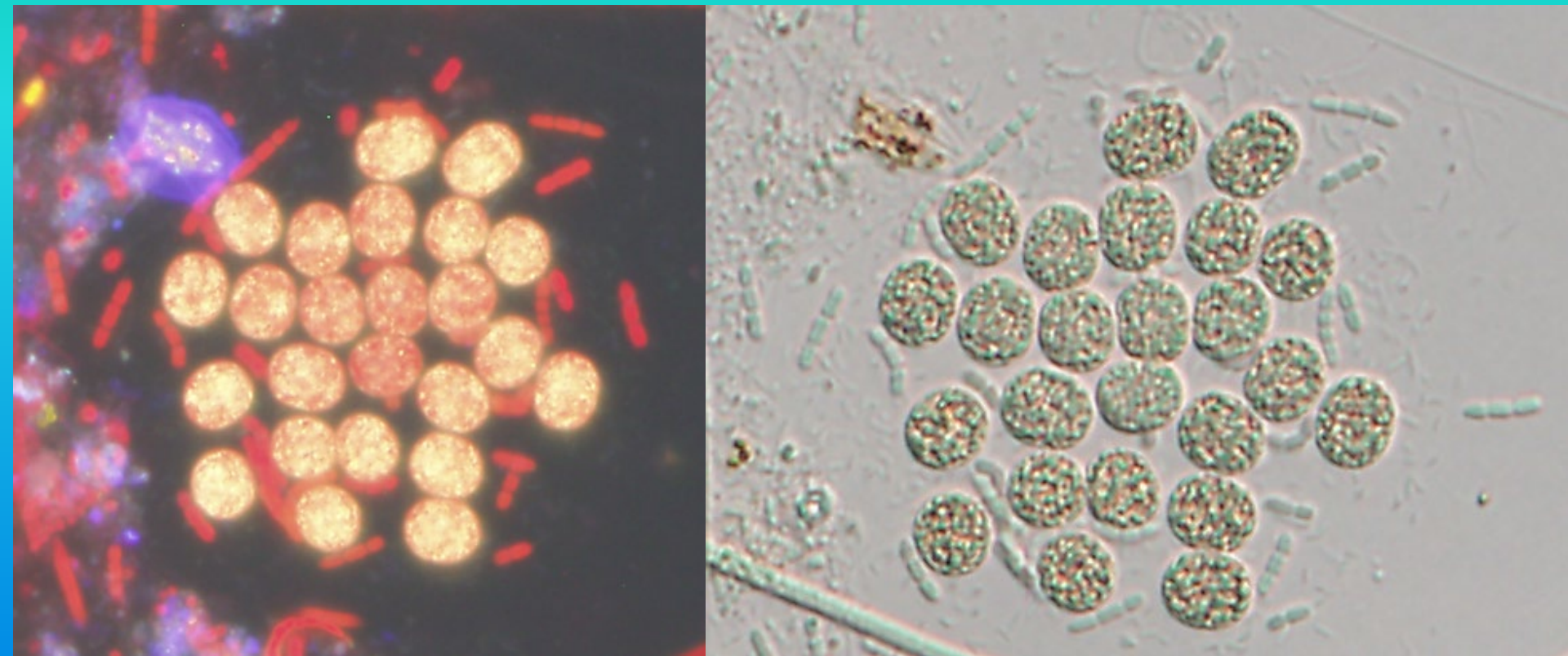
Microcystis aeruginosa- colony variation



Microcystis aeruginosa- close-up



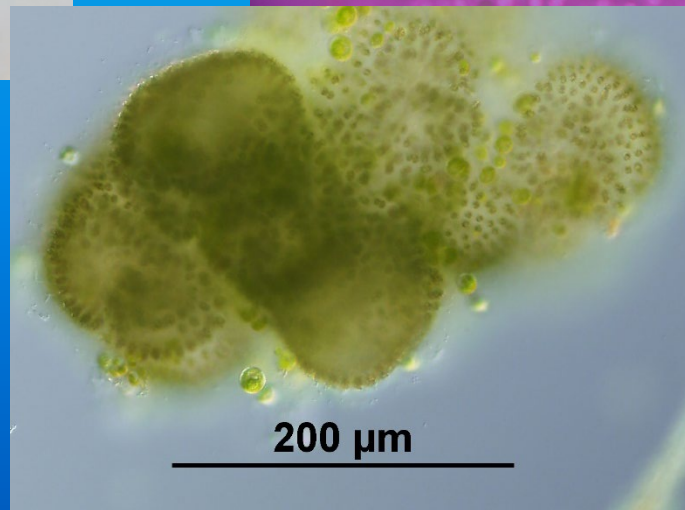
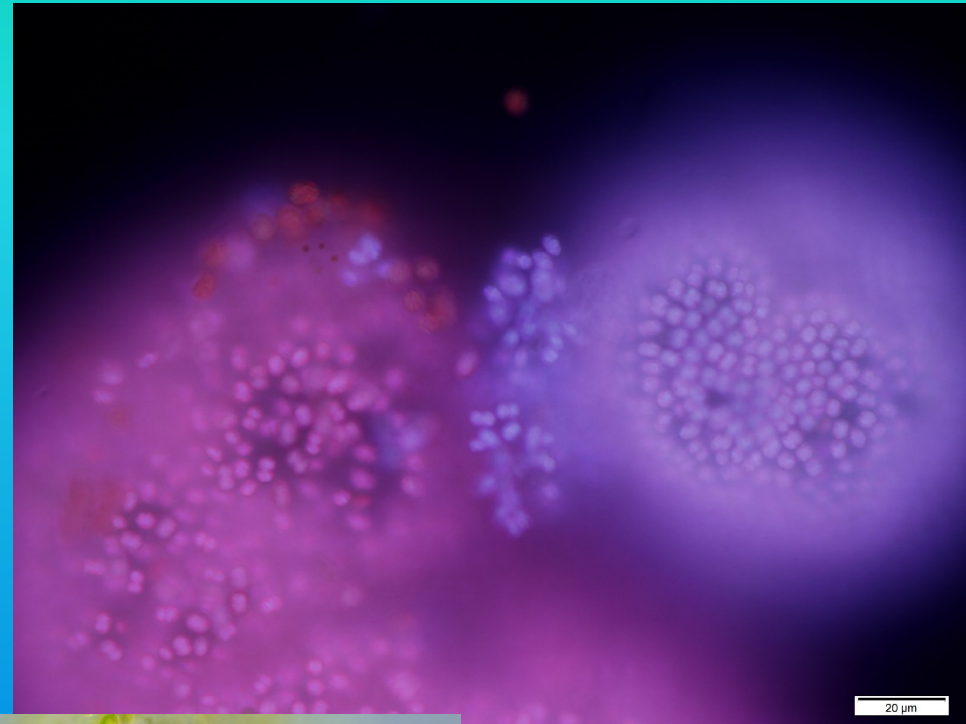
Pseudanabaena with Microcystis



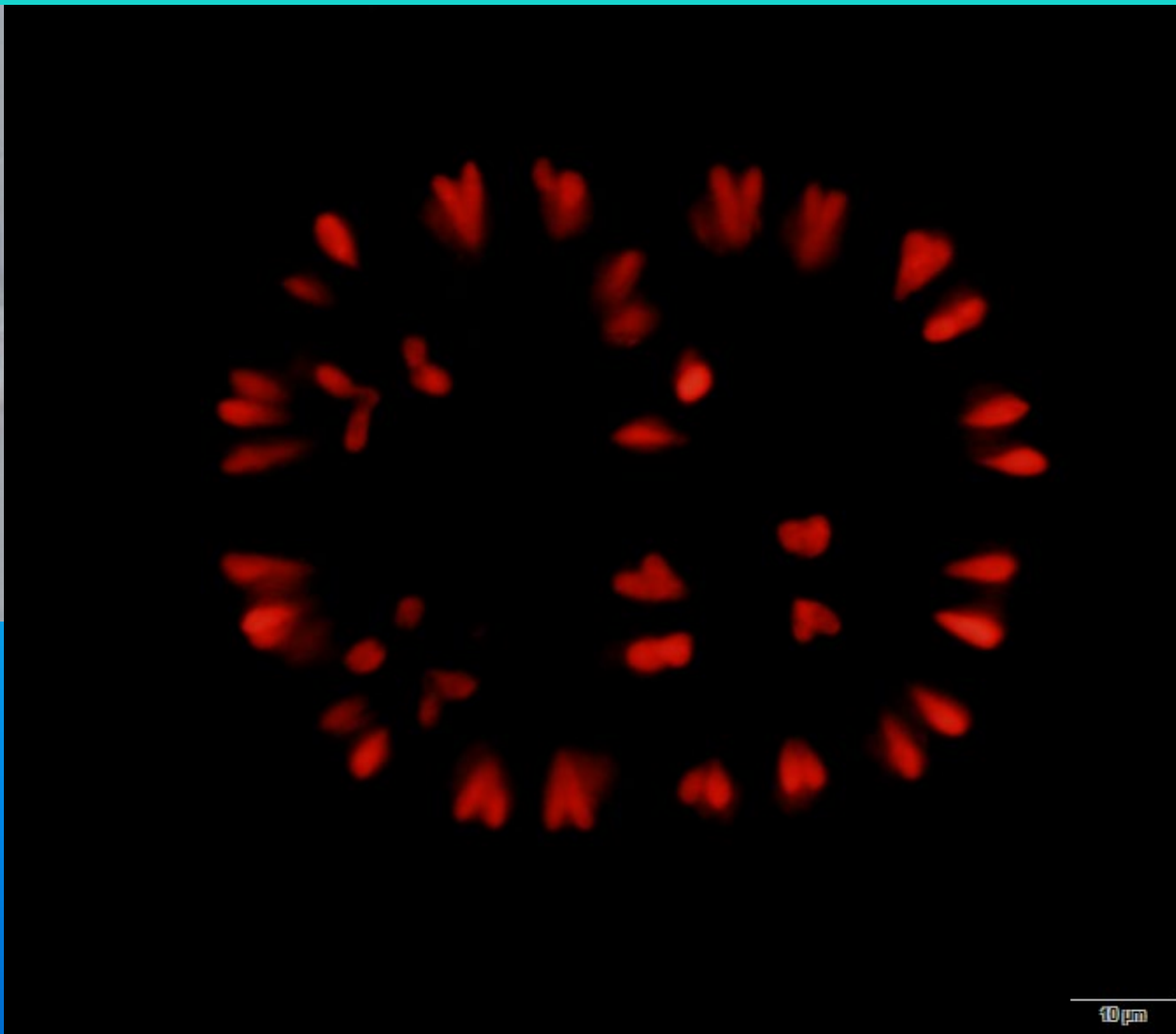
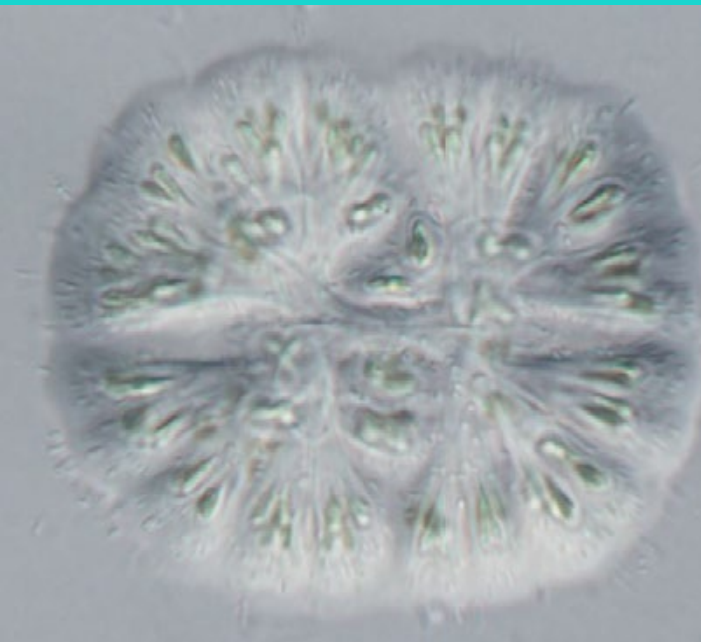
Microcystis wesenbergii



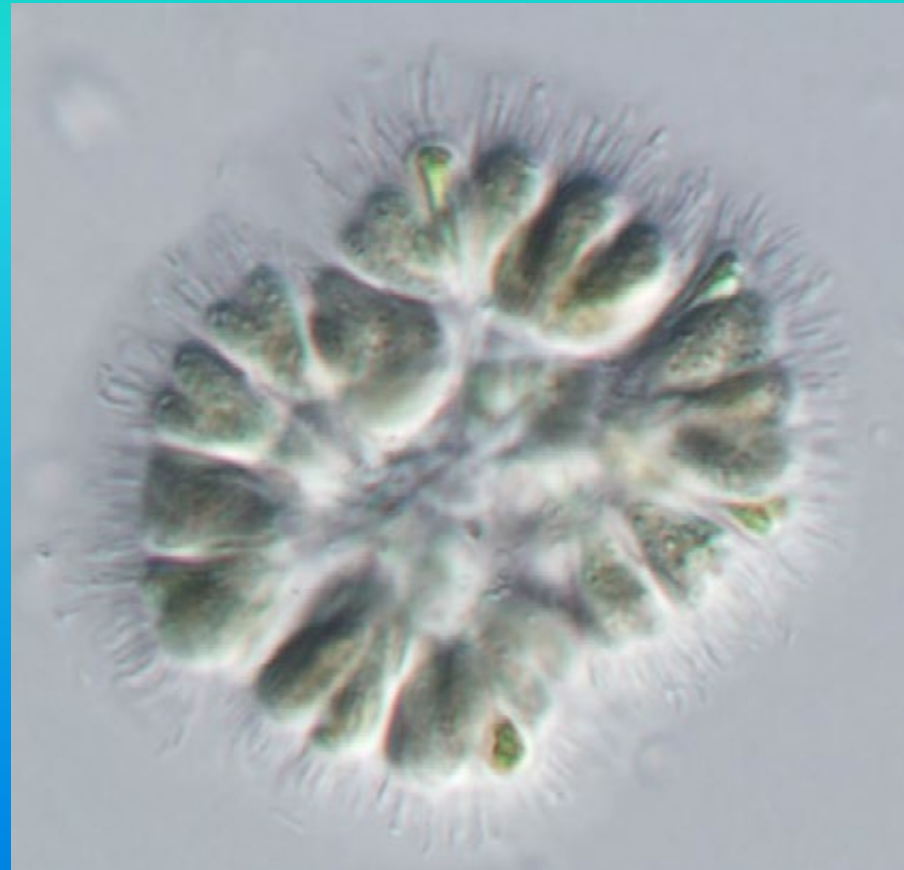
Woronichinia naegeliana



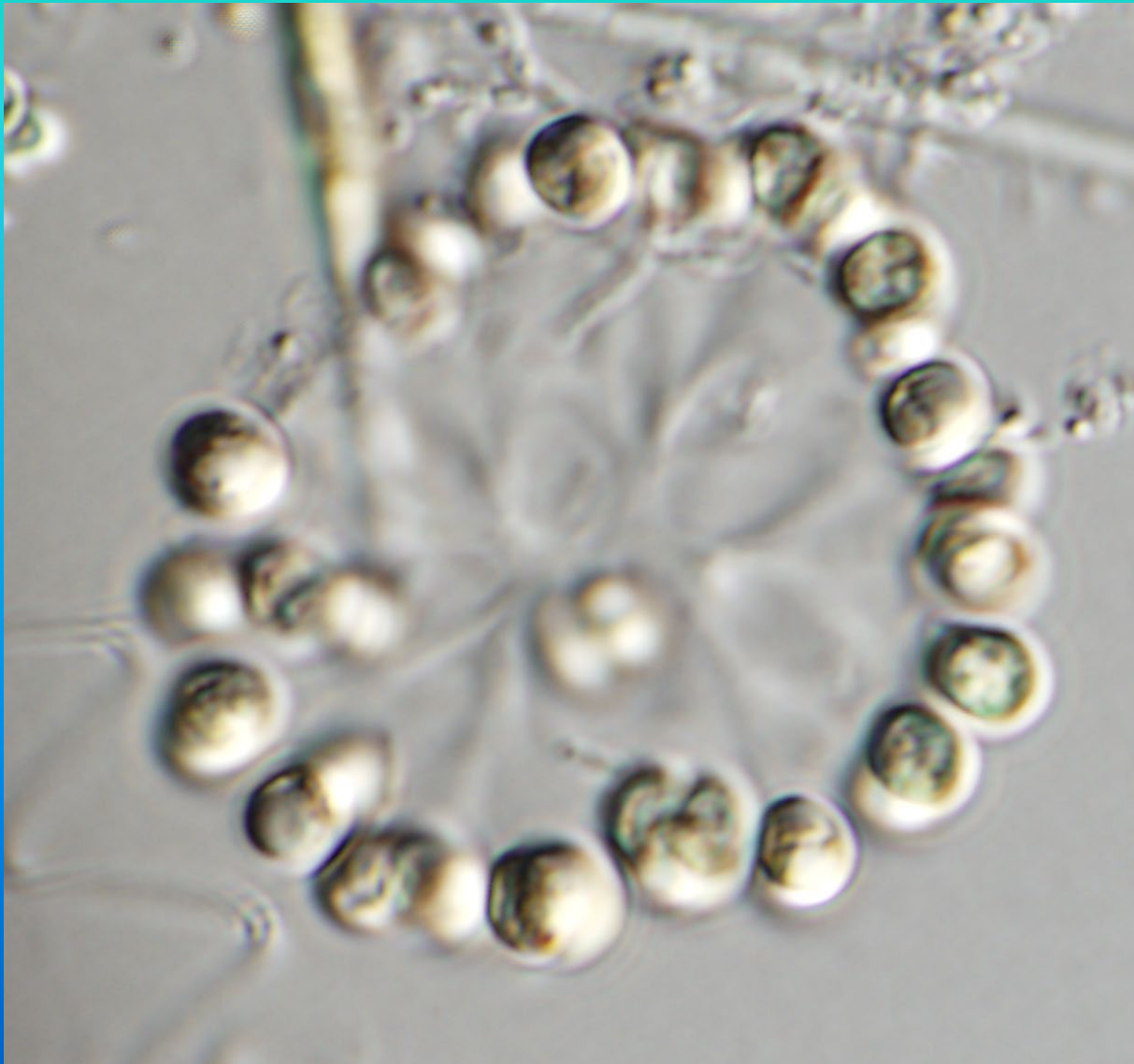
Gomphosphaeria



Gomphosphaeria



Snowella



Morphology 2: Simple Filaments (no akinetes or heterocytes)

Oscillatoriales, Pseudanabaenales, Synechococcales, Spirulinales

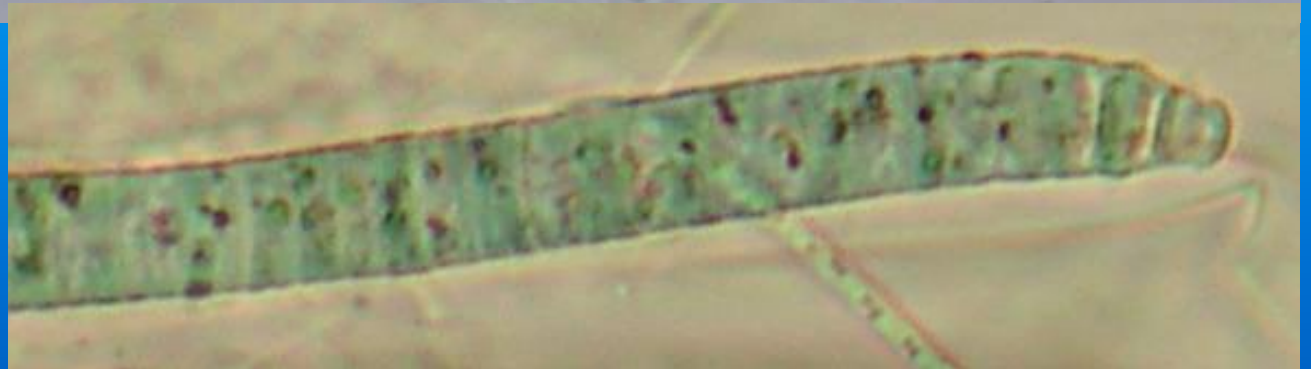
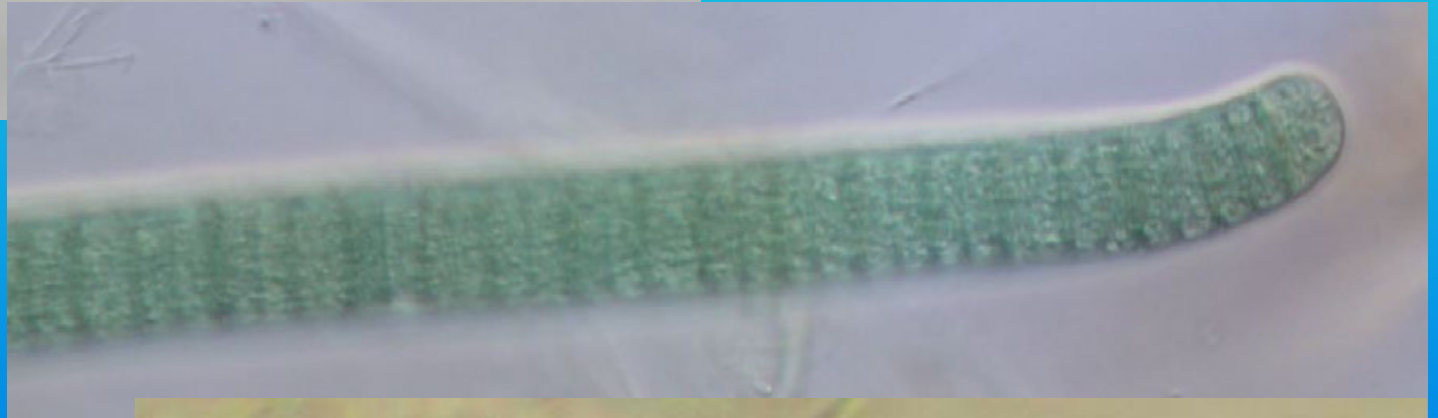
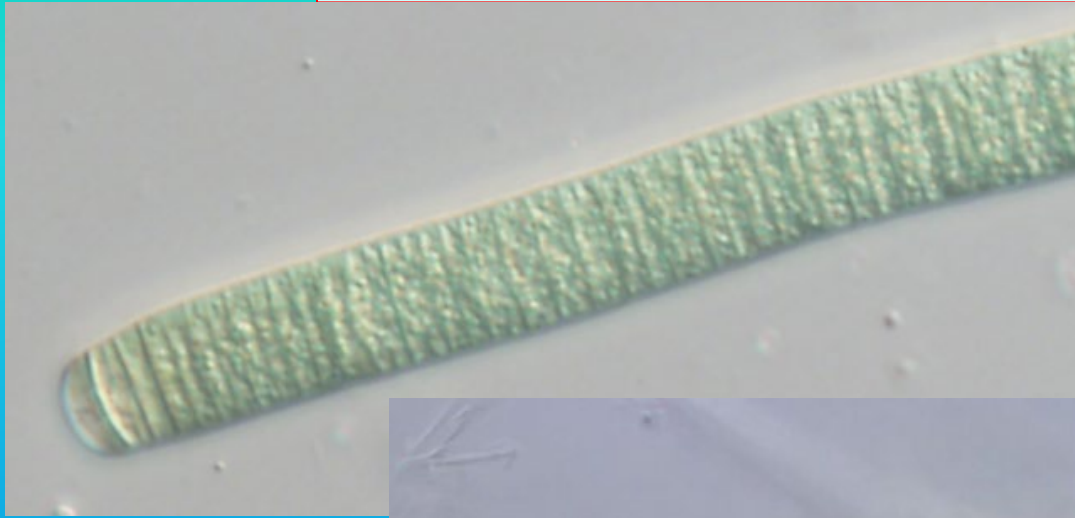
cell length

sheath or not

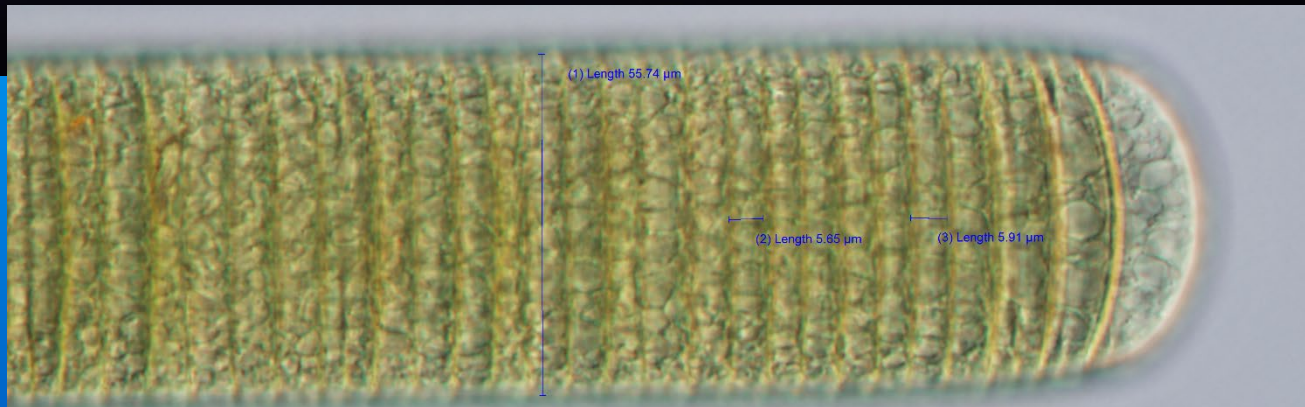
straight or coiled

single or bundles

*Oscillatoria: cells short;
sheath not apparent*

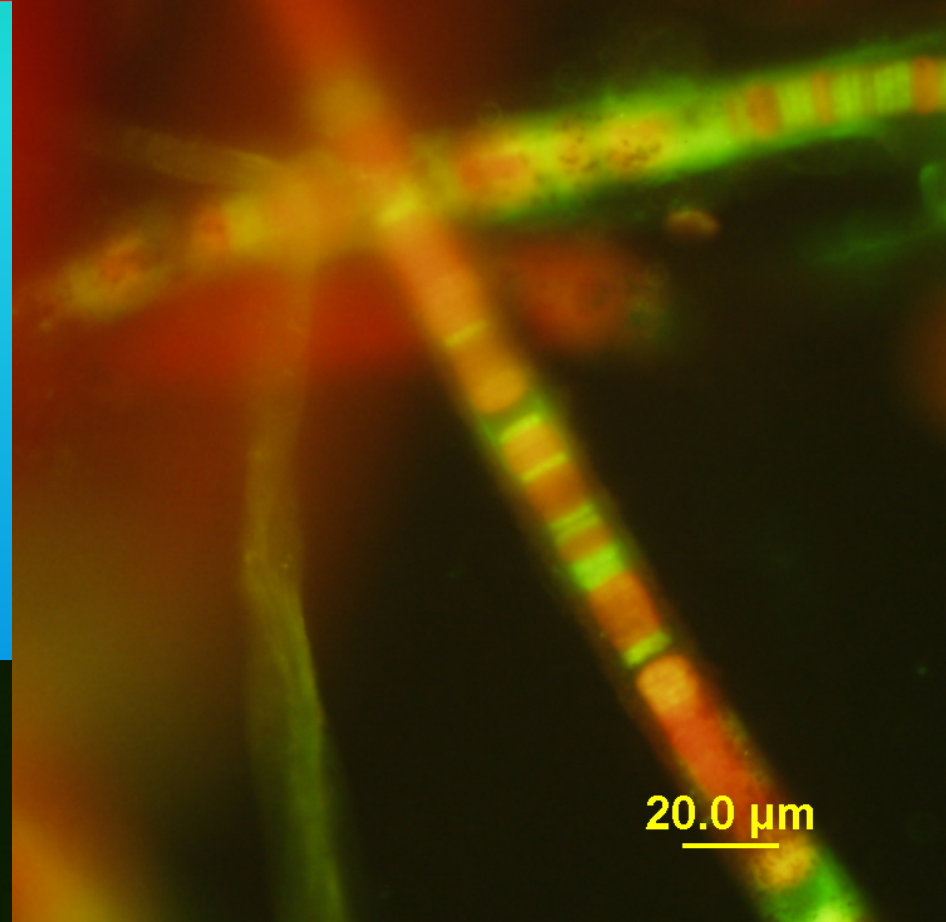
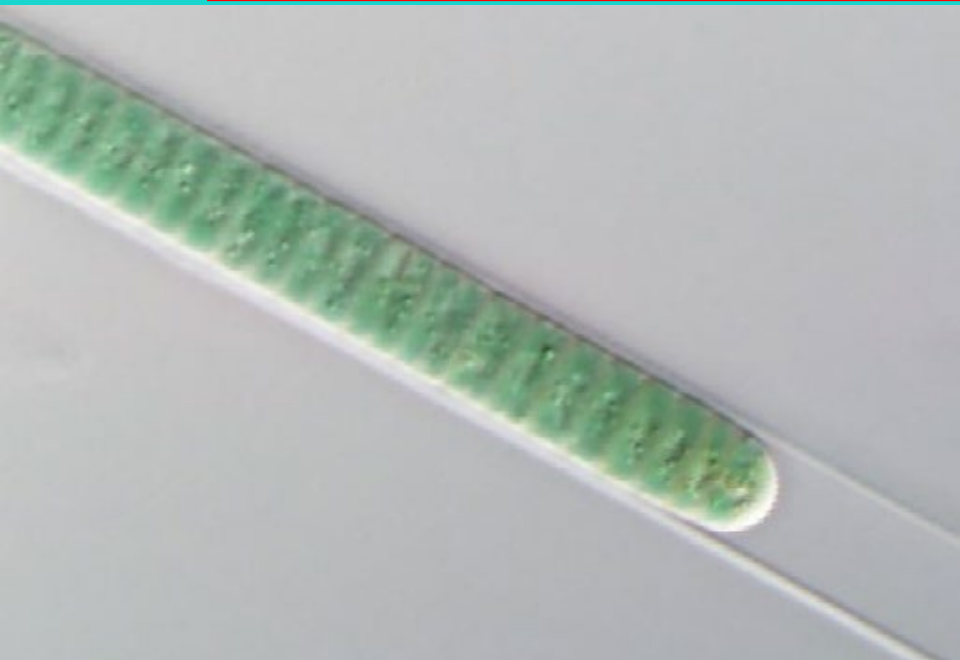


Oscillatoria - art

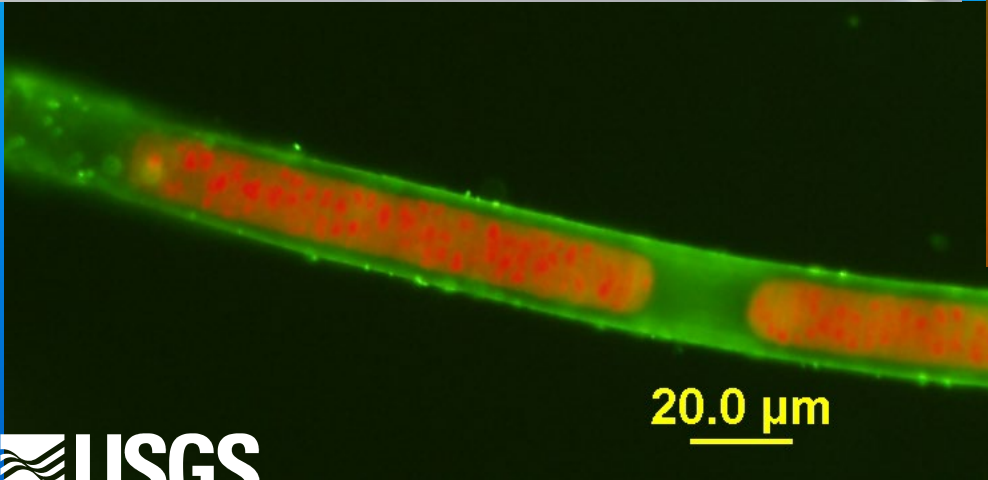


20 μm

Lyngbya: with sheath, benthic and no aerotopes



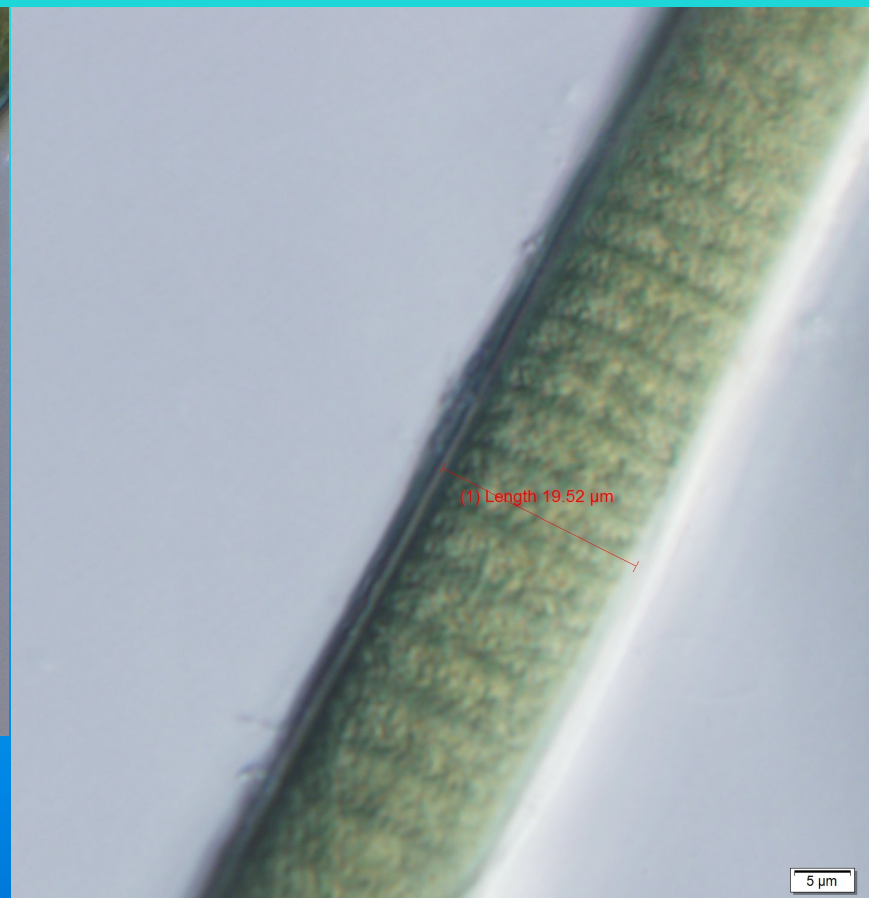
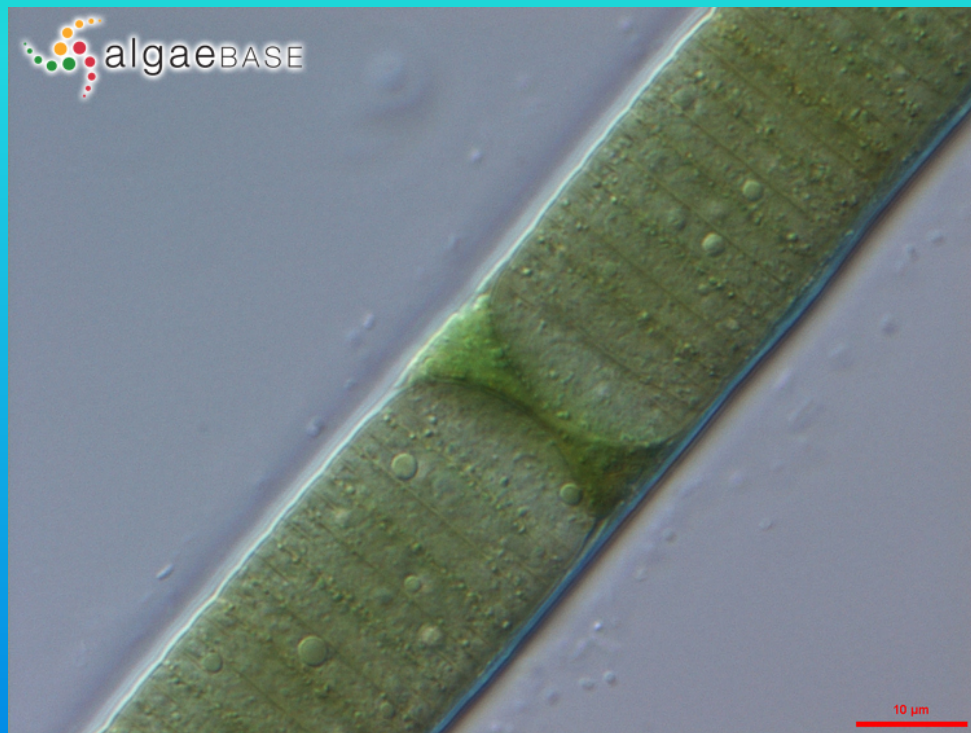
20.0 μm



20.0 μm

Limnographis (reclassified, i.e., *Lyngbya* in 2013: planktonic and aerotopes)

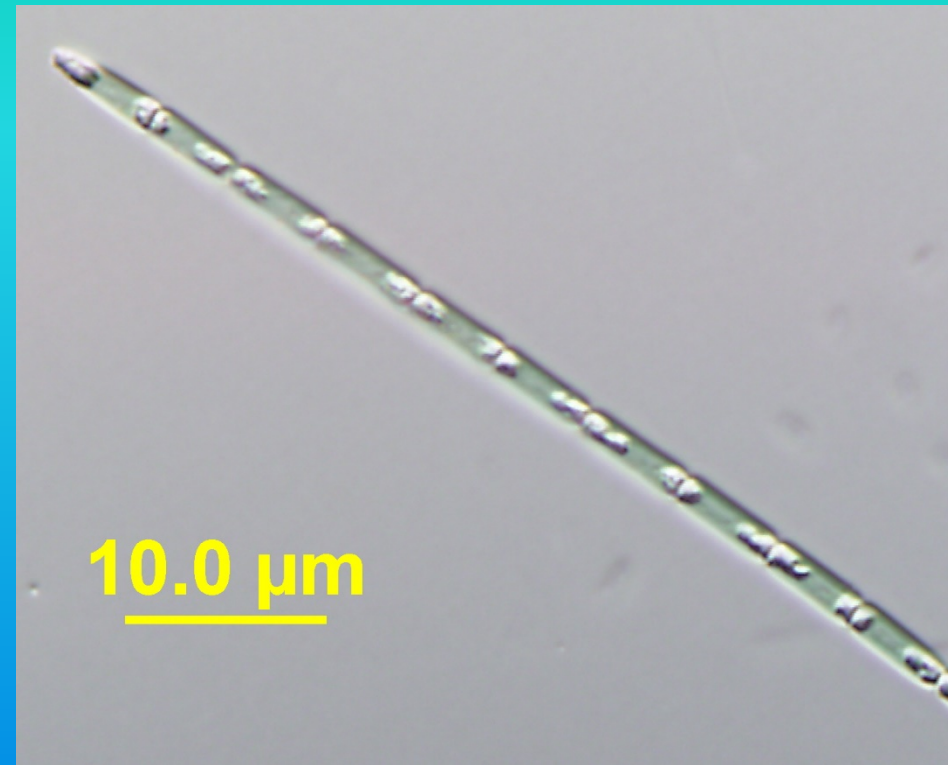
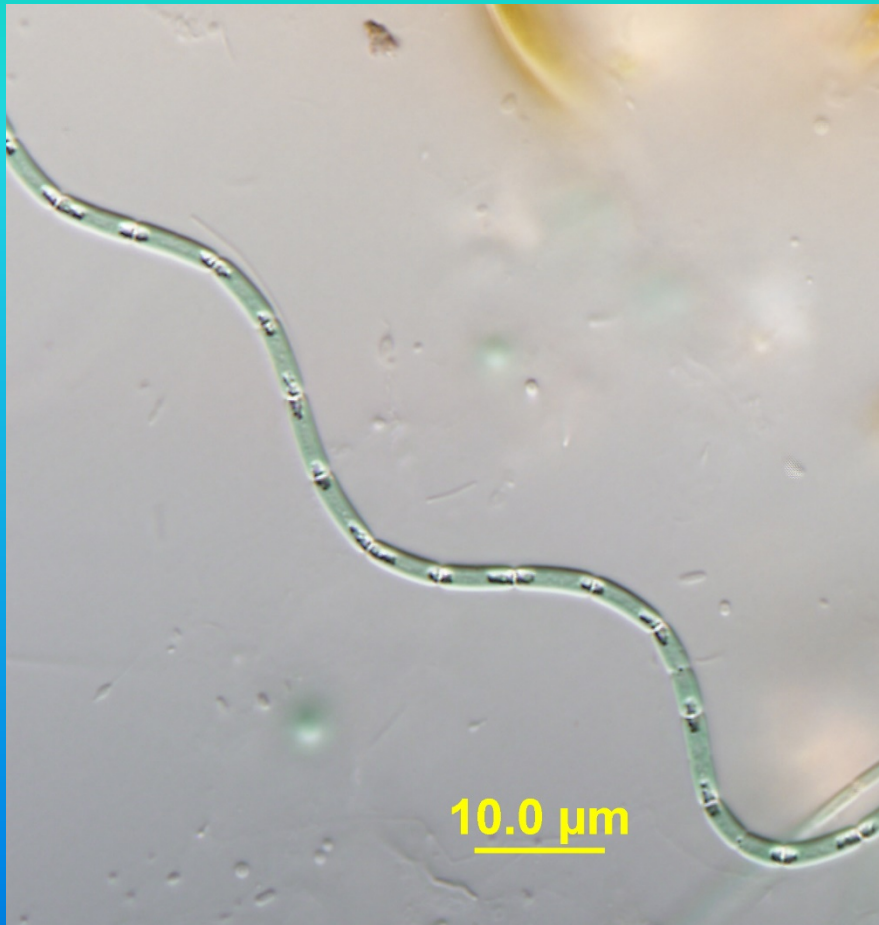
algaeBASE



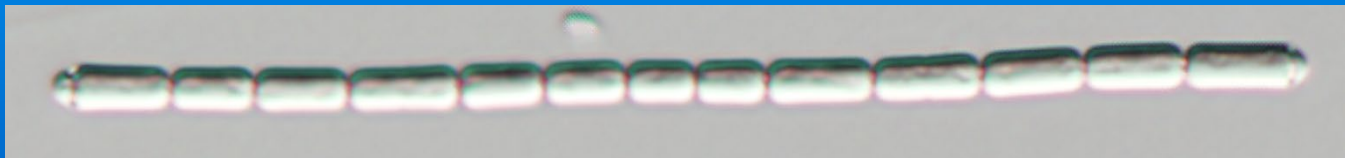
Planktothrix



Limnothrix

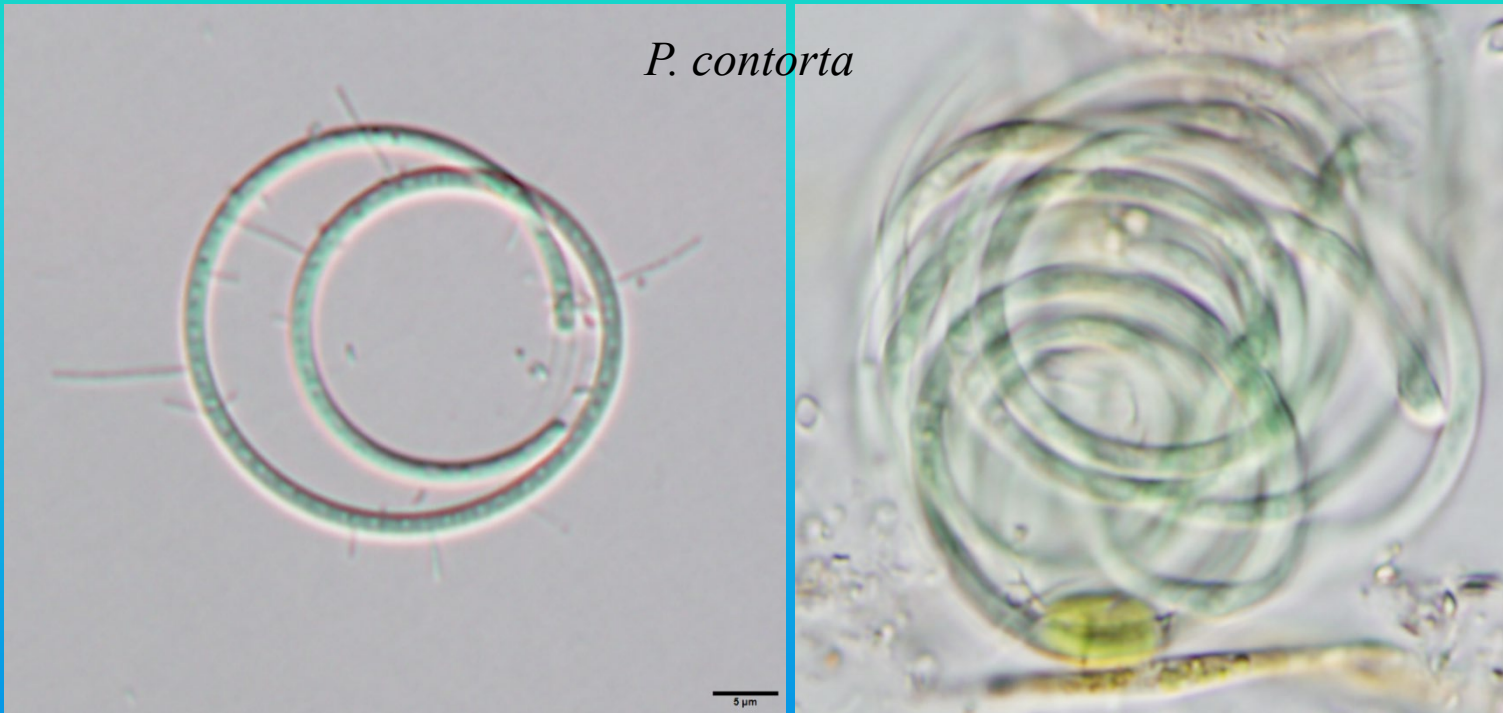


Komvophoron

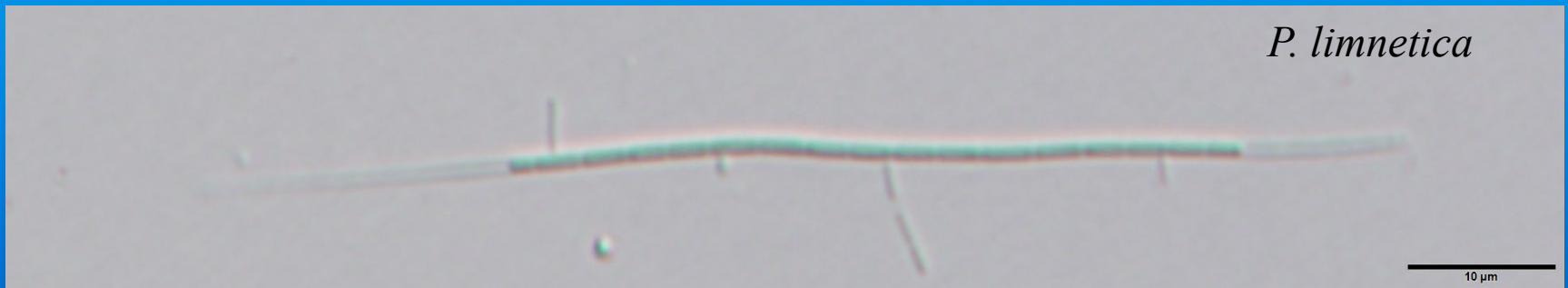


Planktolyngbya

P. contorta



P. limnetica



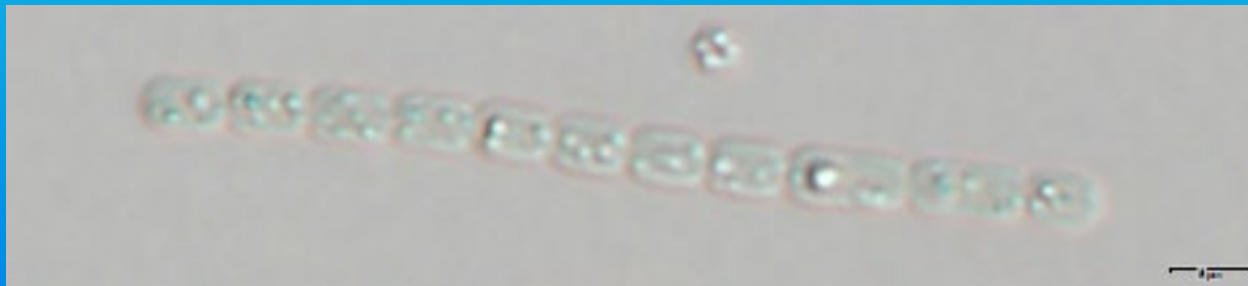
Pseudanabaena



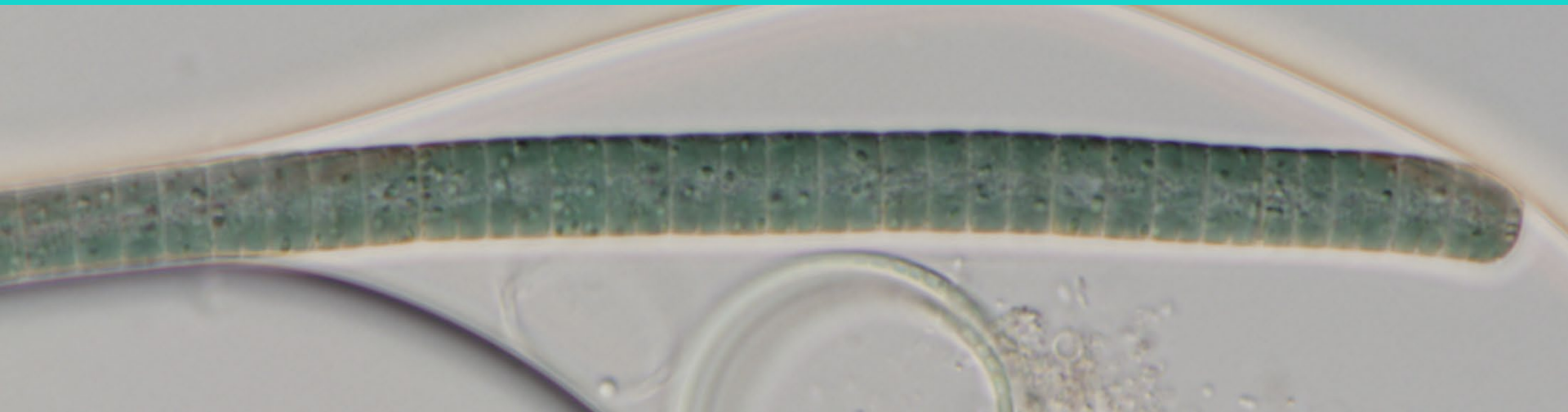
Pseudanabaena



5 μm

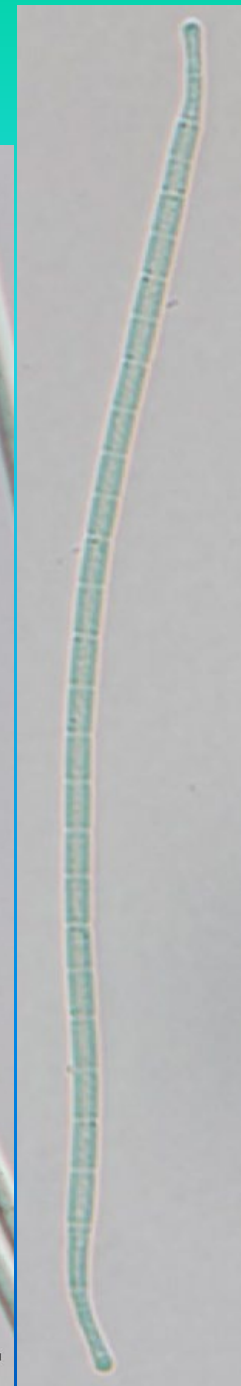
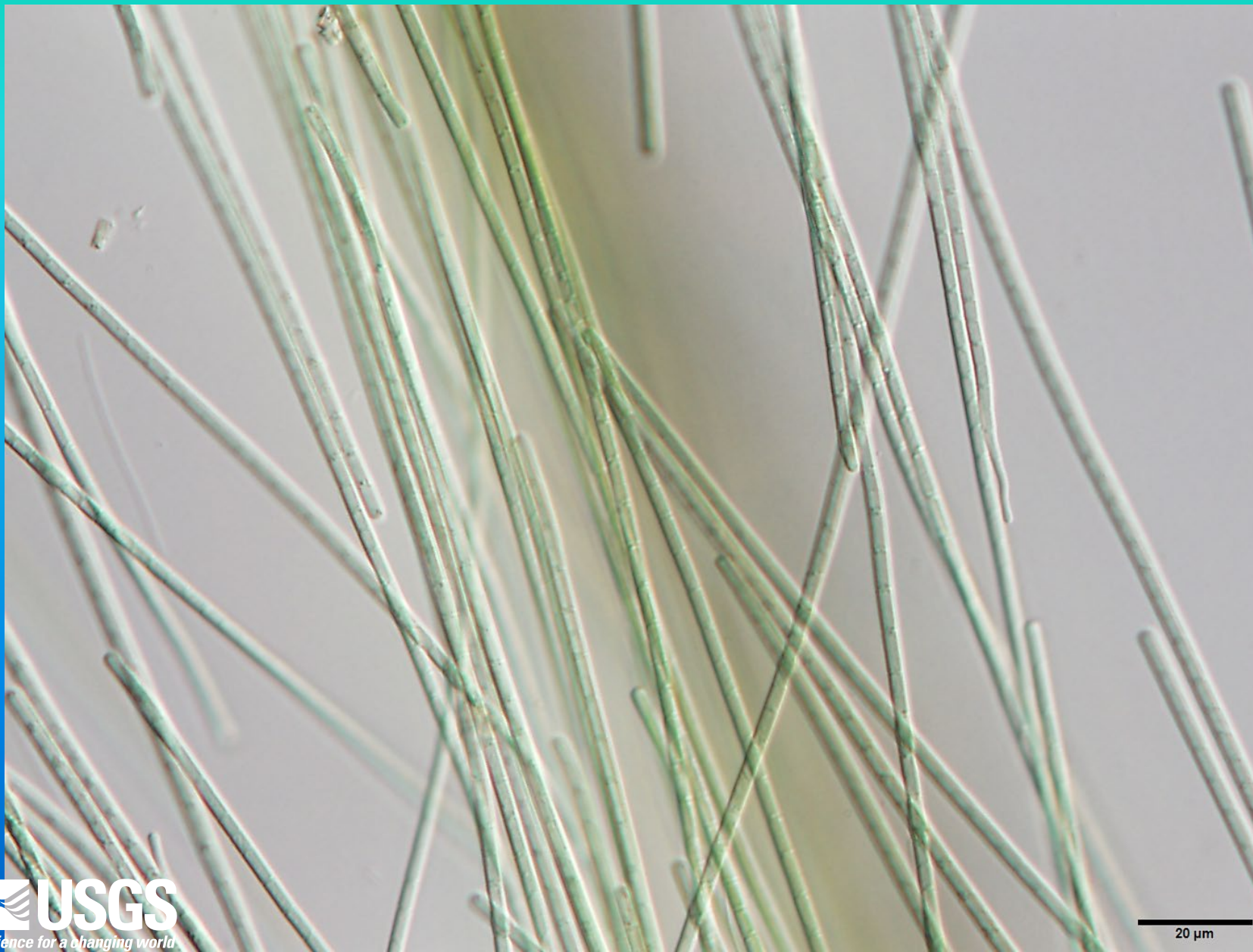


Phormidium



20 μ m

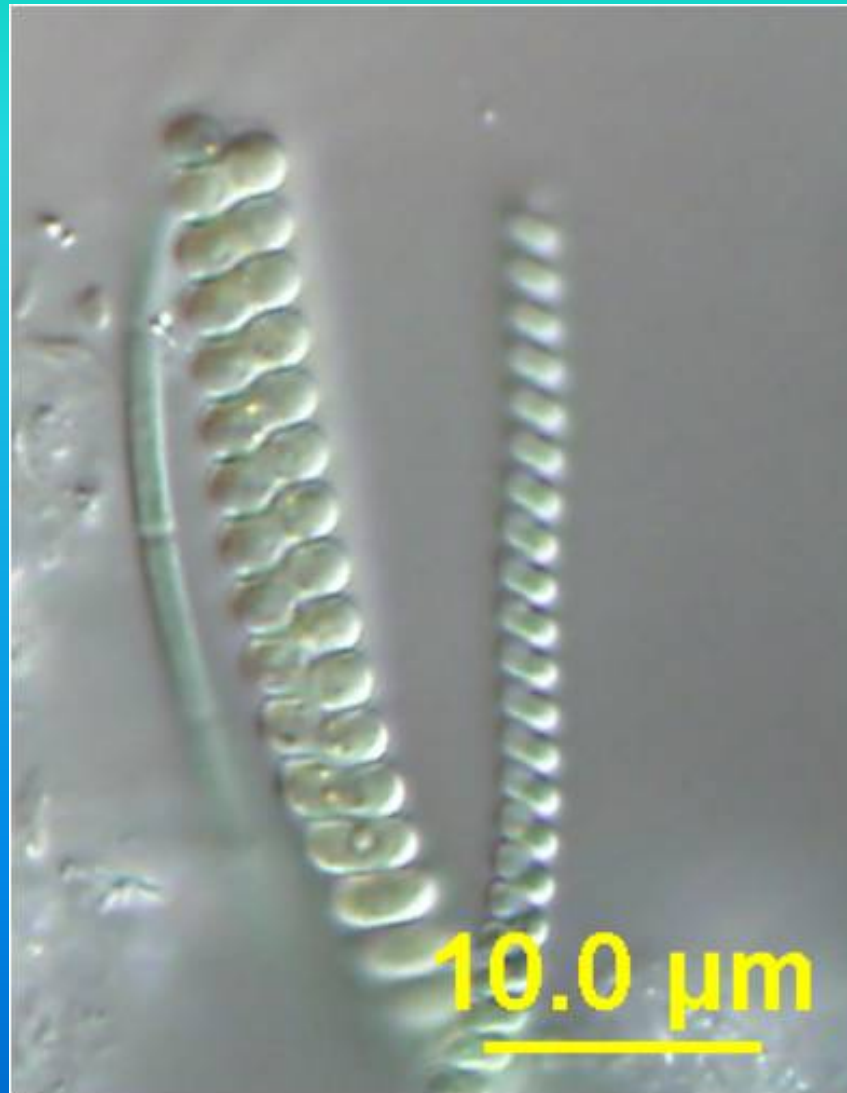
Geitlerinema



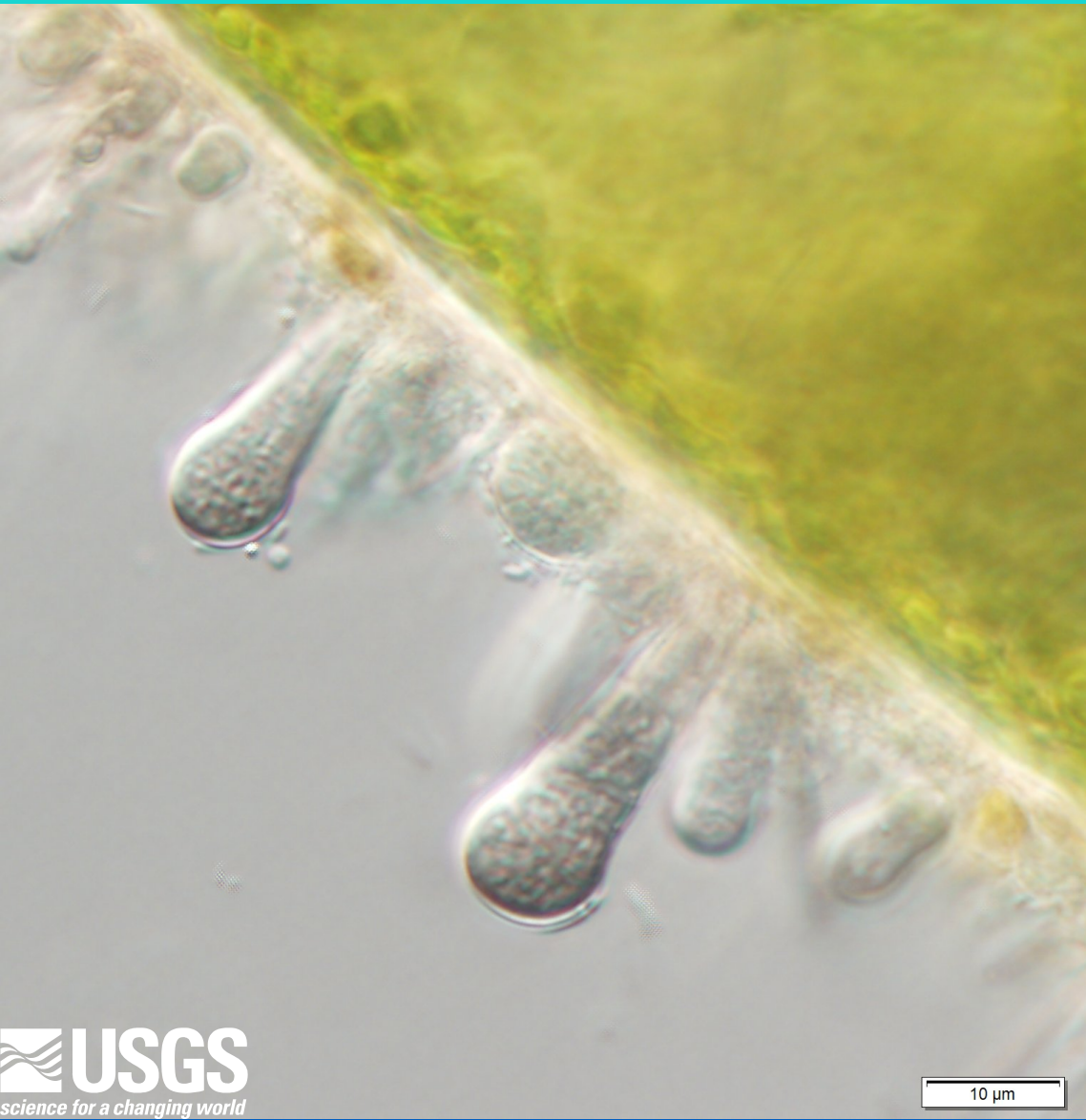
Schizothrix



Spirulina



Chamaecalyx (epiphyte)



Morphology 2: Filaments

Nostocales (have heterocytes)

unbranched

branched

tapered
trichome?

true vs. false branching

heterocyte location

planktonic
vs. benthic

Straight Planktonic: *Dolichospermum* (2009) (prior name was *Anabaena*)



Staight Planktonic: *Dolichospermum* (2009)

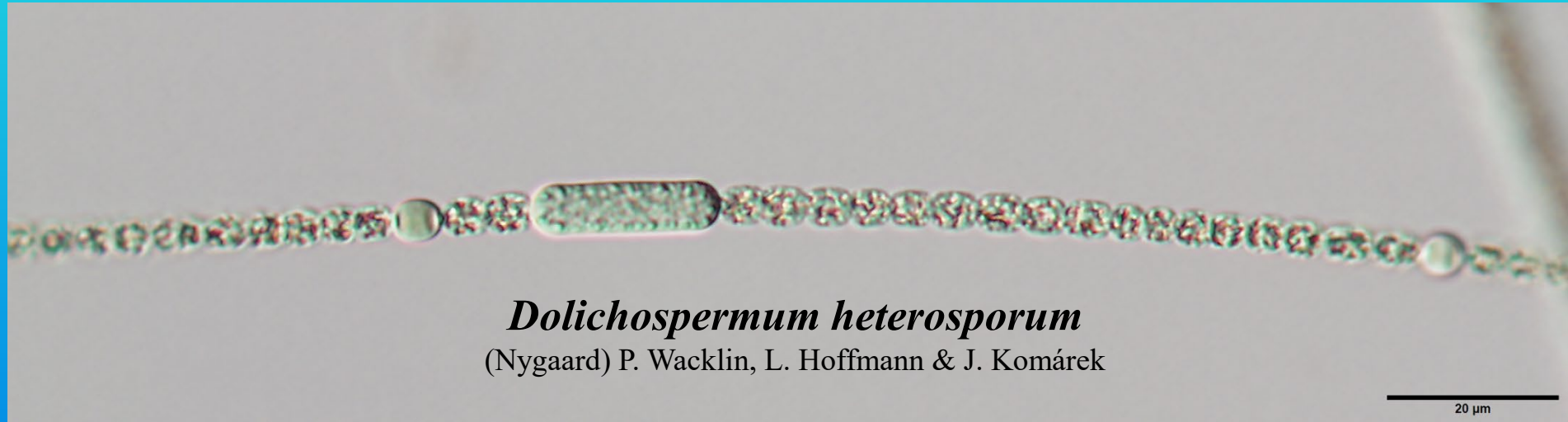
(prior name was *Anabaena*)

Straight

D. planktonicum

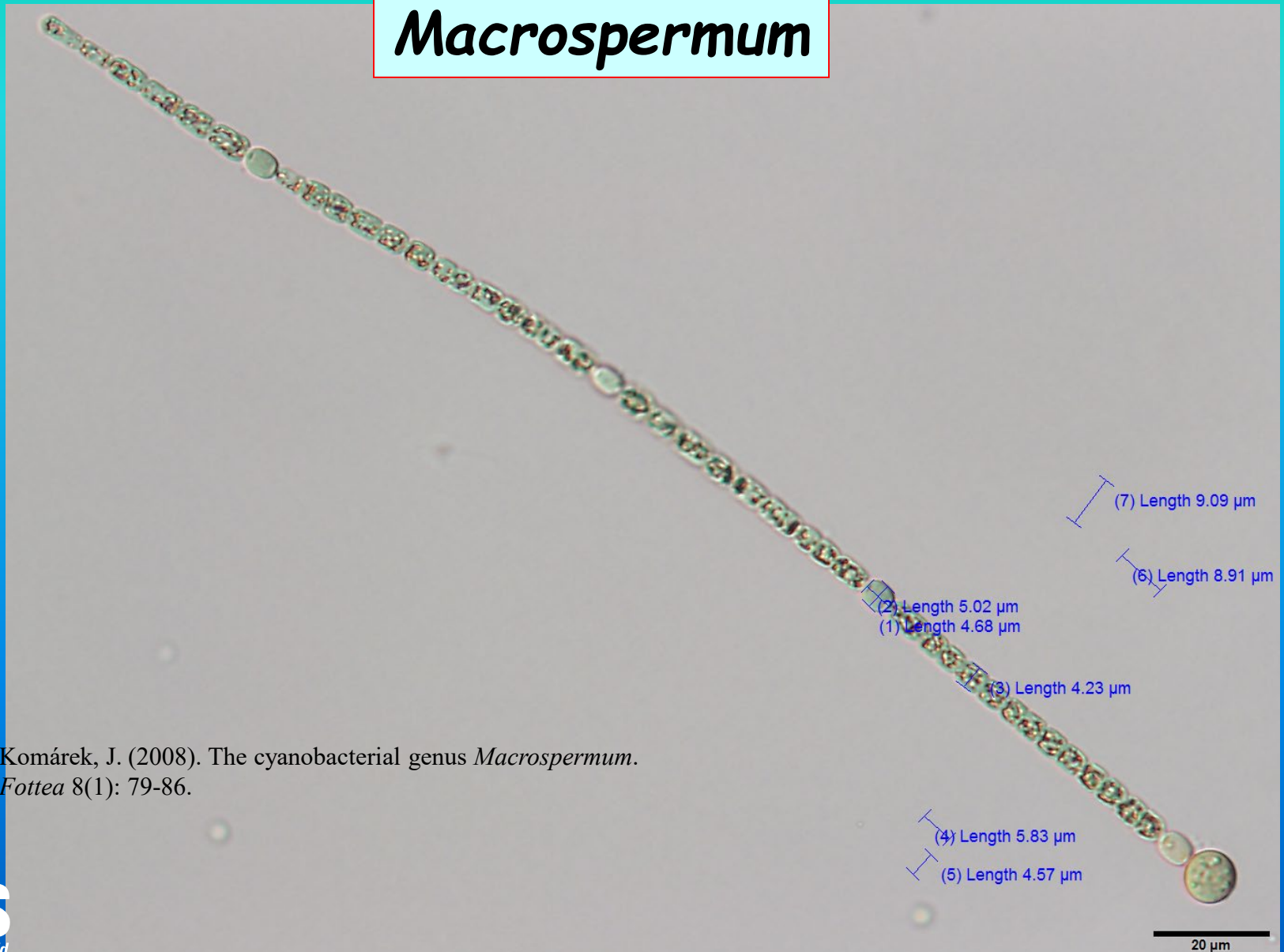
10 µm

**Staight Planktonic:
Dolichospermum
(2009)
(prior name was *Anabaena*)**



Dolichospermum heterosporum
(Nygaard) P. Wacklin, L. Hoffmann & J. Komárek

Straight Planktonic *Macrospermum*

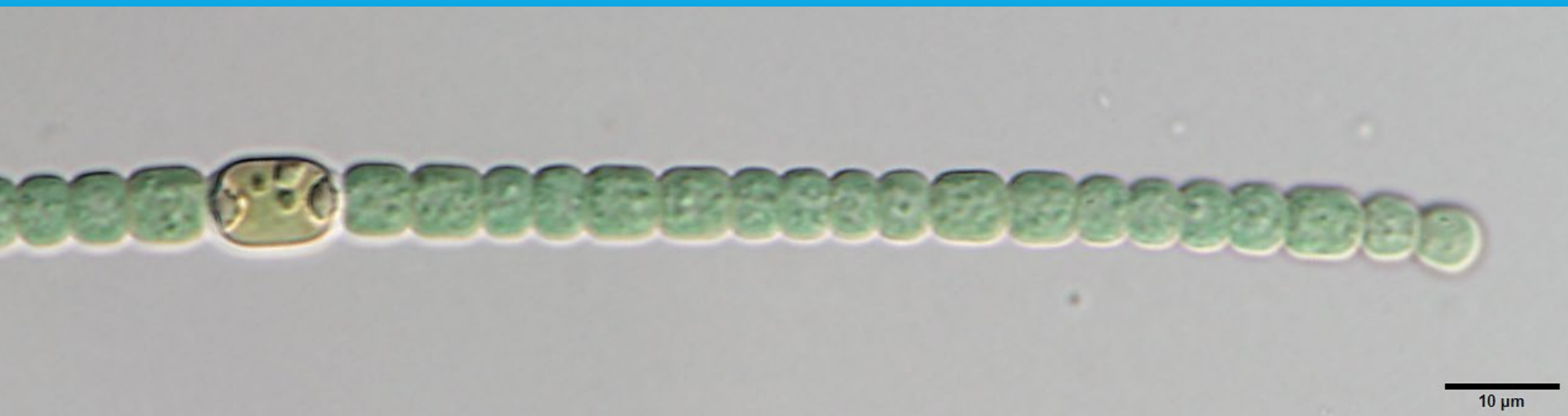
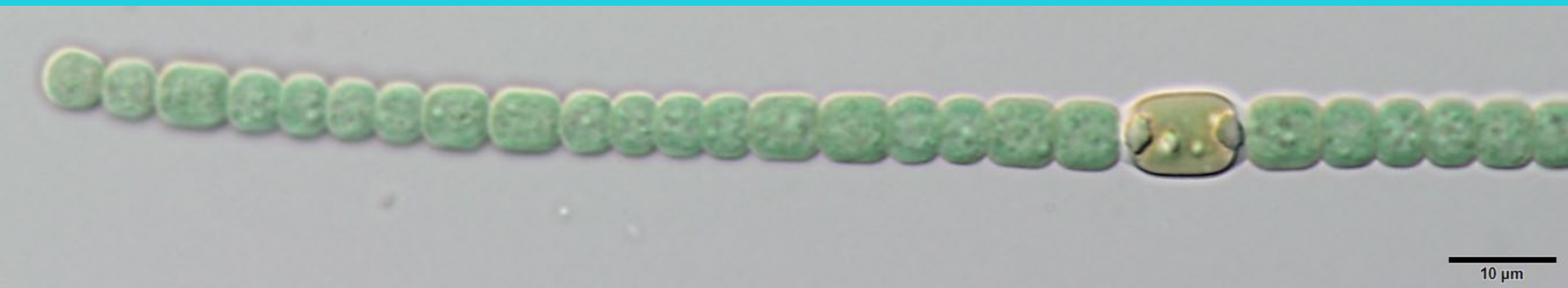


Komárek, J. (2008). The cyanobacterial genus *Macrospermum*.
Fottea 8(1): 79-86.

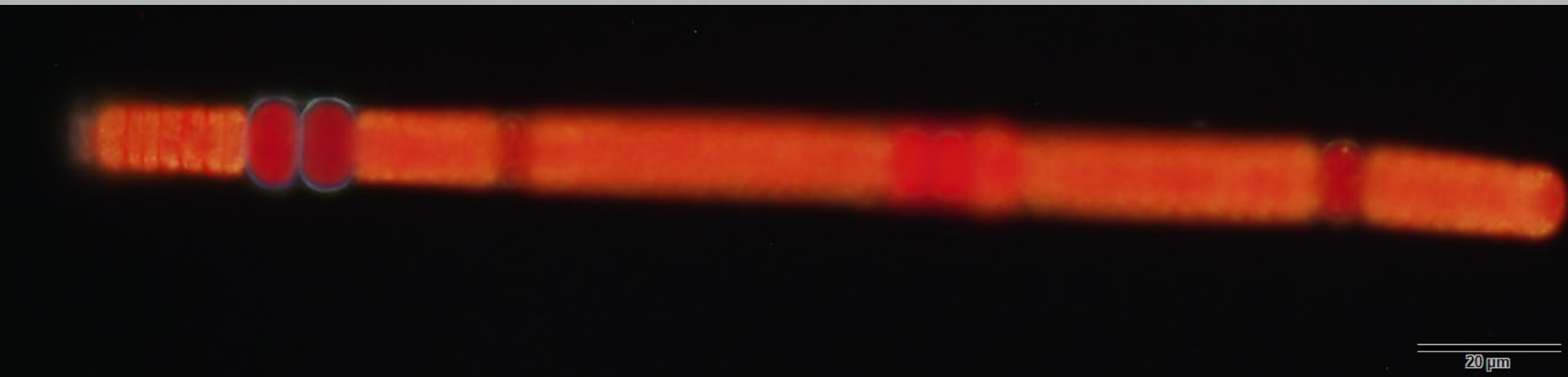
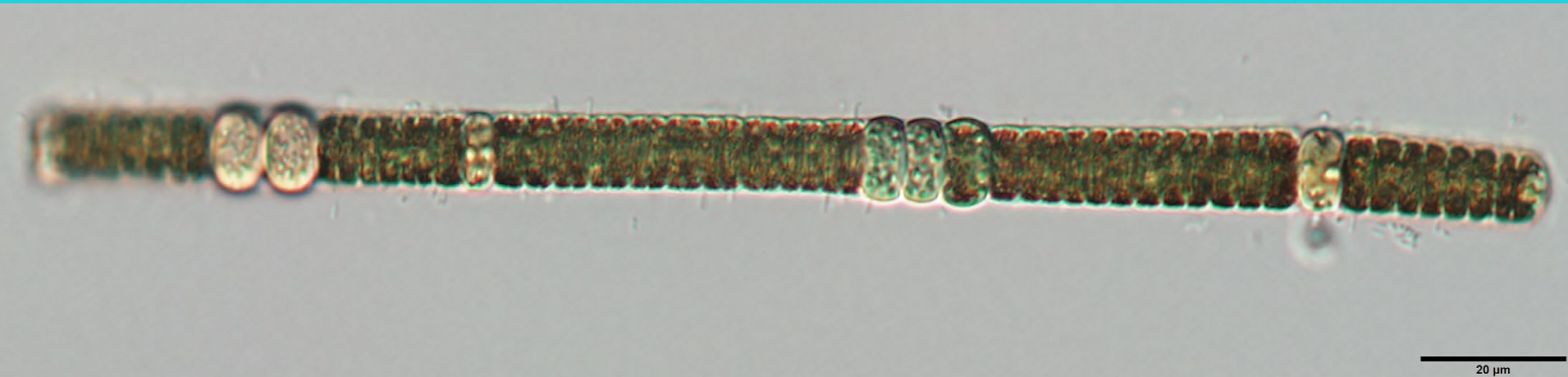
Straight Planktonic *Macrospermum*



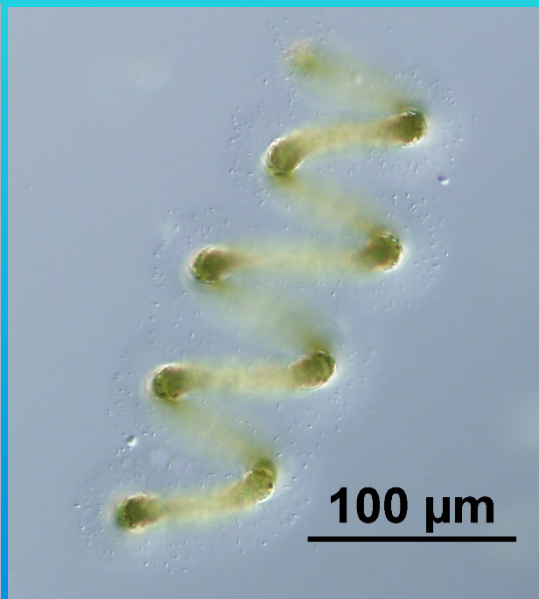
Straight Benthic *Anabaena*/*Trichormus*



Unbranched Planktonic *Nodularia*



Coiled Planktonic: *Dolichospermum* (prior name was *Anabaena*)



Coiled Planktonic: *Dolichospermum* (prior name was *Anabaena*)

Coiled



20 µm

Coiled Planktonic *Sphaerospermopsis*



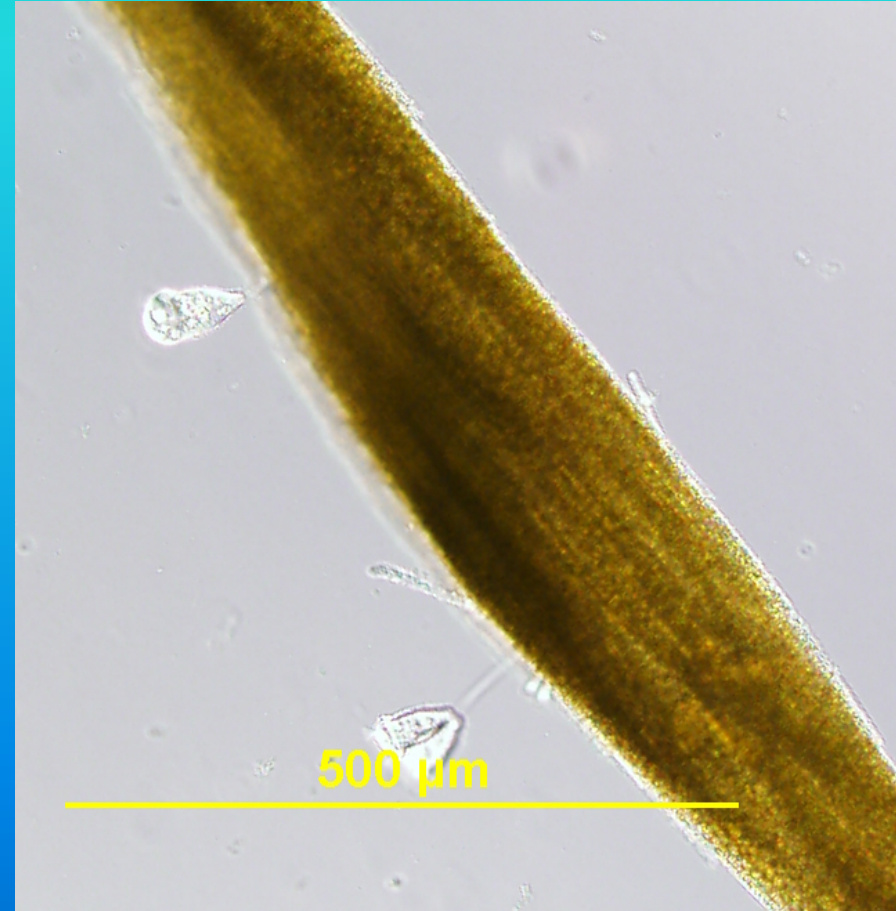
Unbranched Planktonic *Anabaenopsis*



Nostoc



Unbranched planktonic and bundles *Aphanizomenon* (AFA)



Unbranched planktonic -akinetes
seasonally common
Aphanizomenon (AFA)



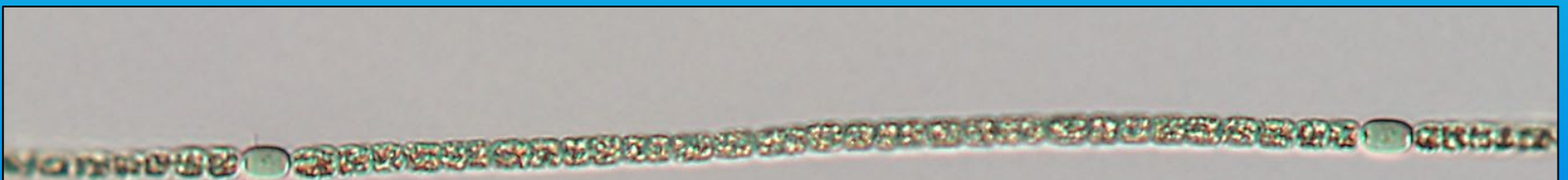
Aphanizomenon



Cuspidothrix



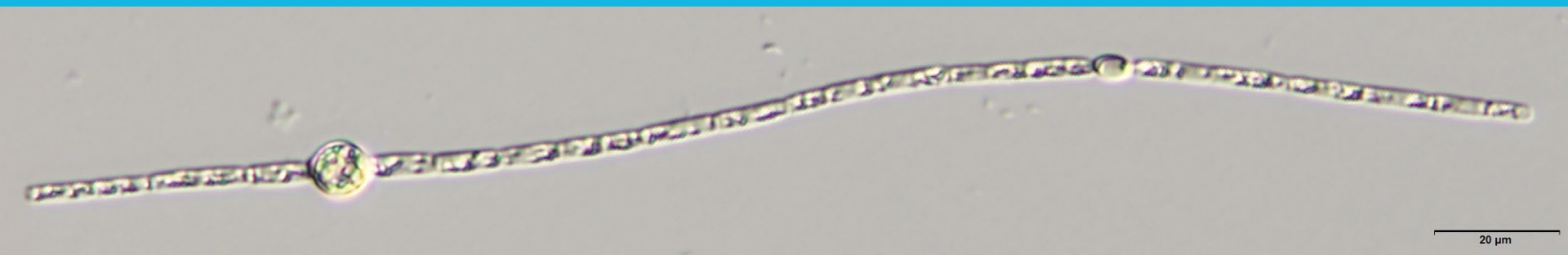
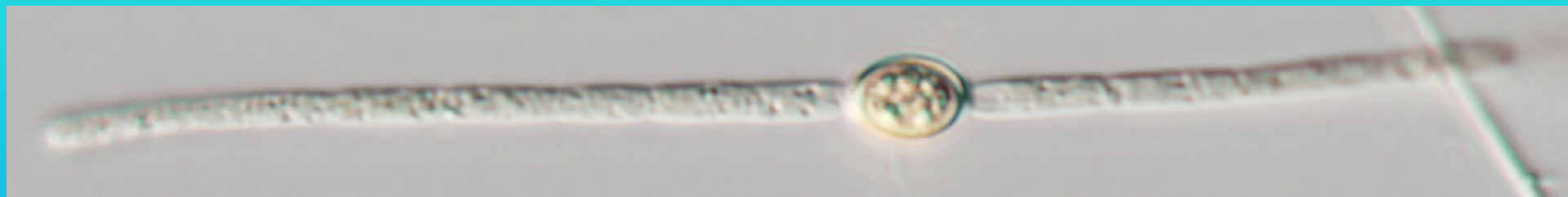
20 μ m



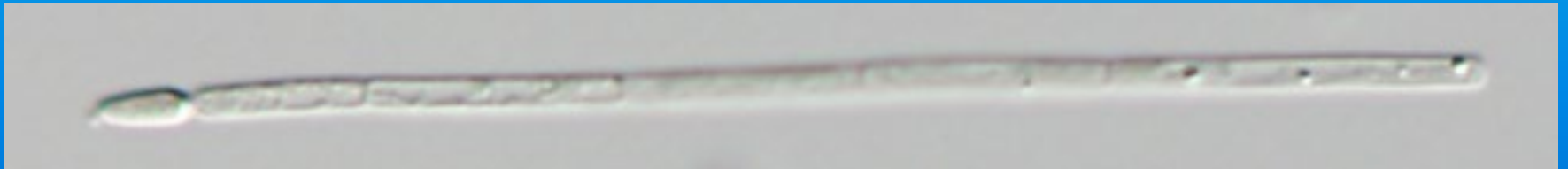
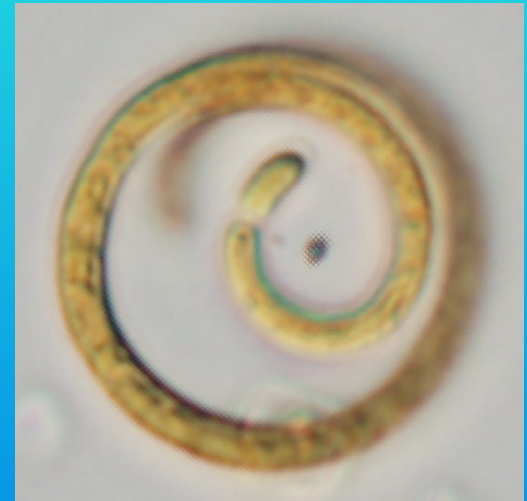
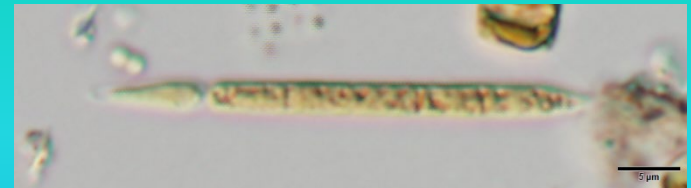
20 μ m



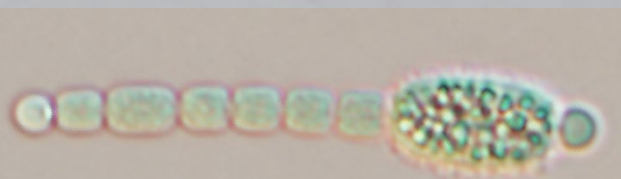
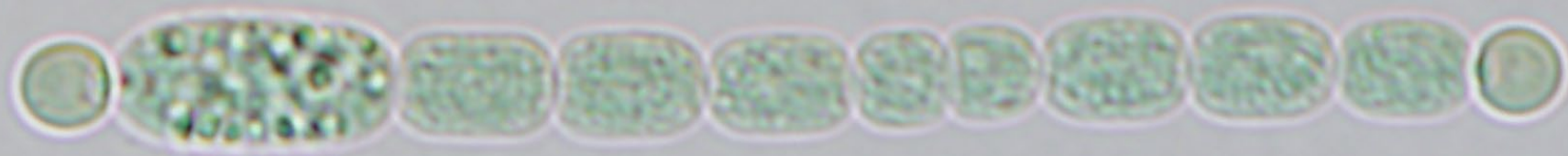
Chrysosporum



Cylindrospermopsis



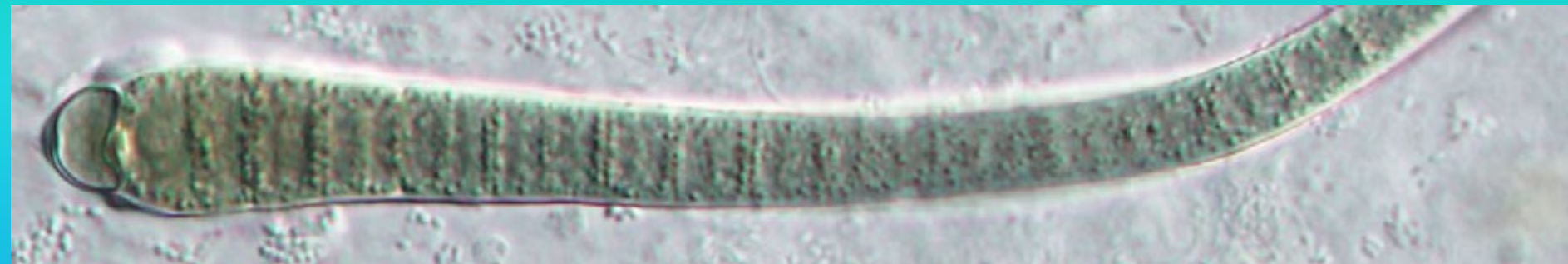
Cylindrospermum



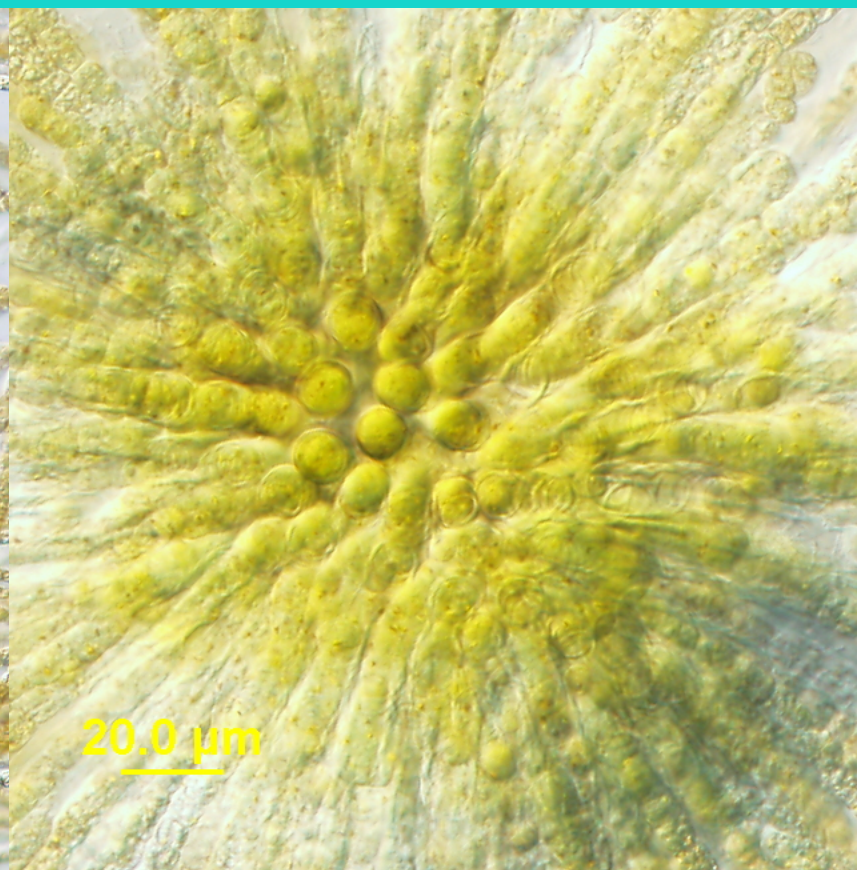
Wollea



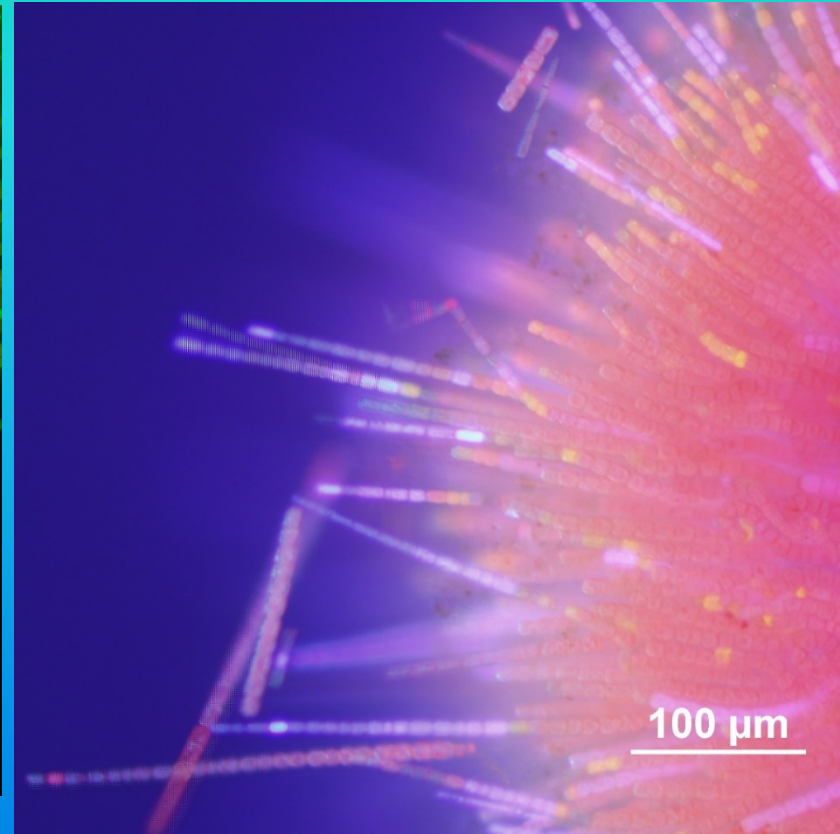
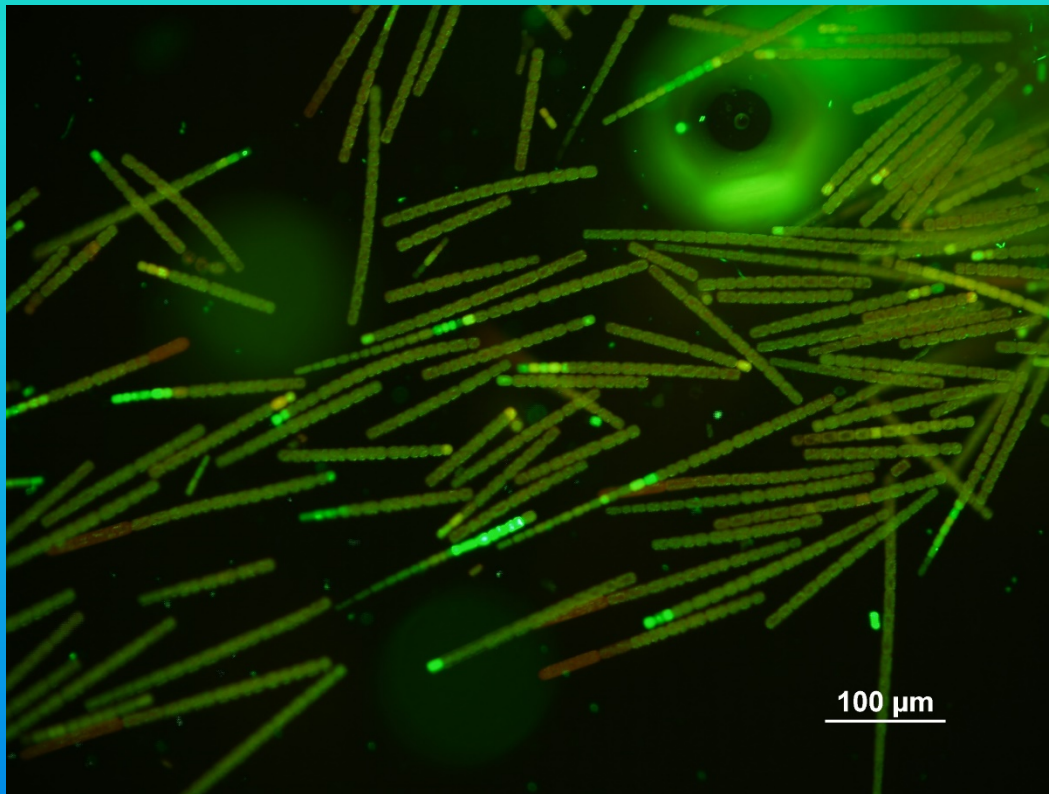
Calothrix

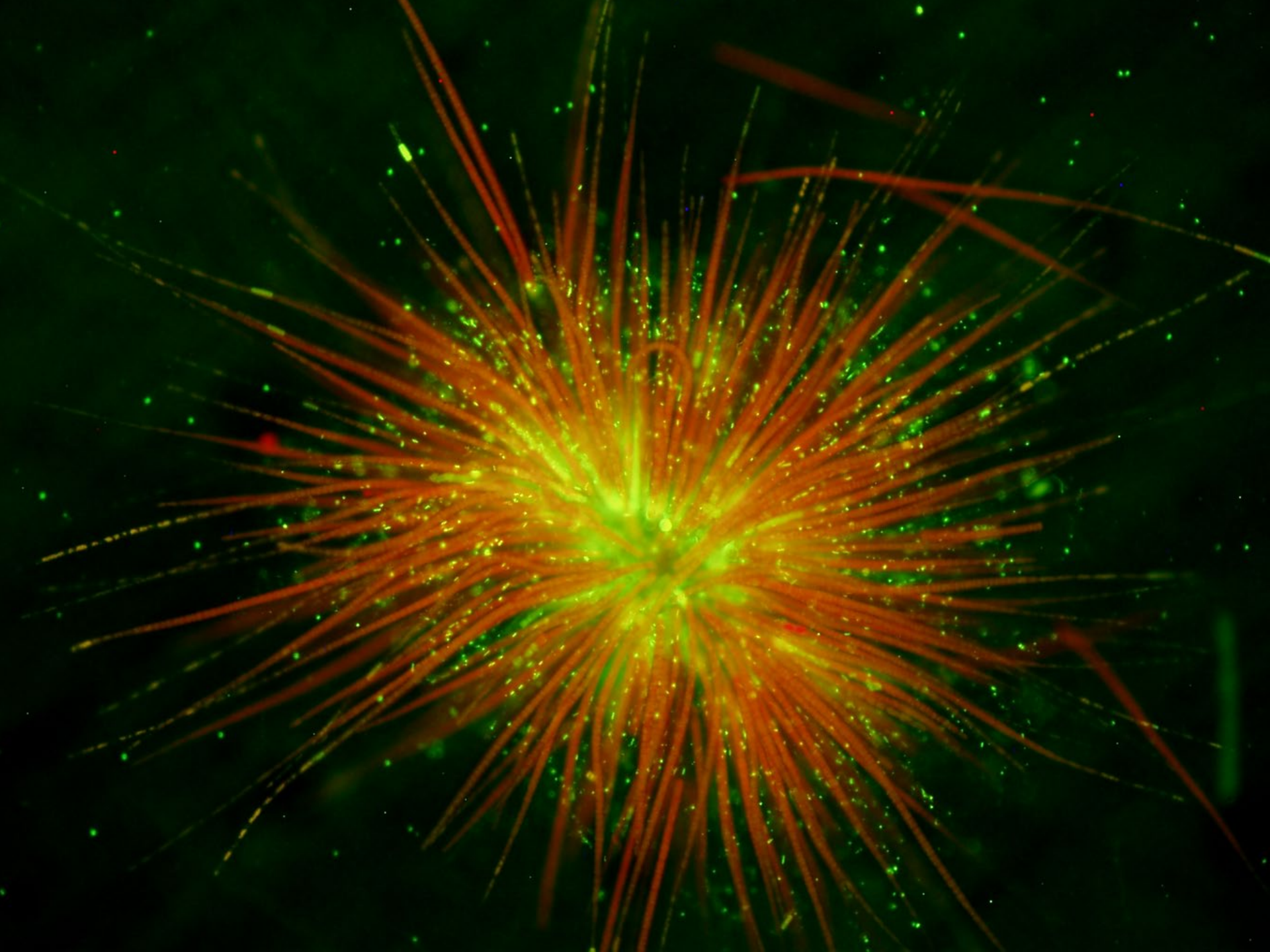


Gloeotrichia



Gloeotrichia





Morphology 2: Filaments

Nostocales (have heterocytes)

branched

true vs. false branching



Morphology 2: Filaments

Nostocales (have heterocytes)

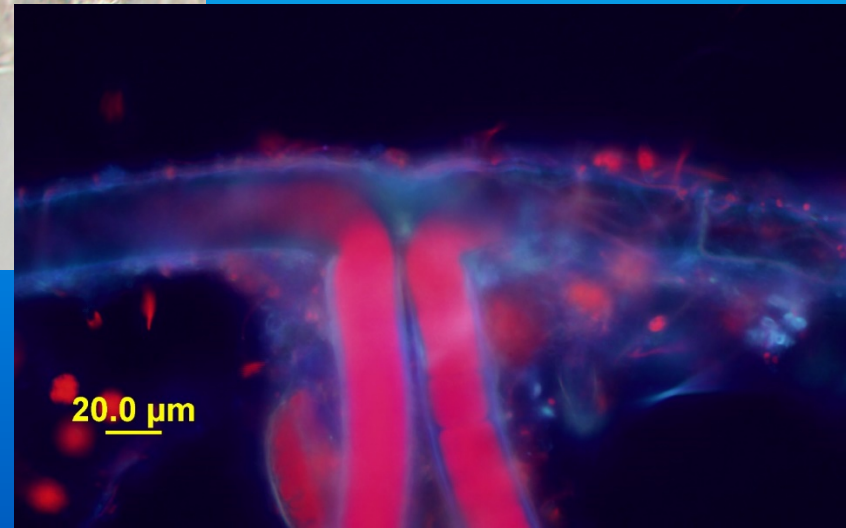
false branching
Hapalosiphon



Morphology 2: Filaments

Nostocales (have heterocytes)

false branching
Scytonema



Morphology 2: Filaments

Nostocales (have heterocytes)

true branching
Iphinoe (*Hapalosiphon*-like)



Morphology 2: Filaments

Nostocales (have heterocytes)

true branching and multiseriate
Stigonema



Thank You!

