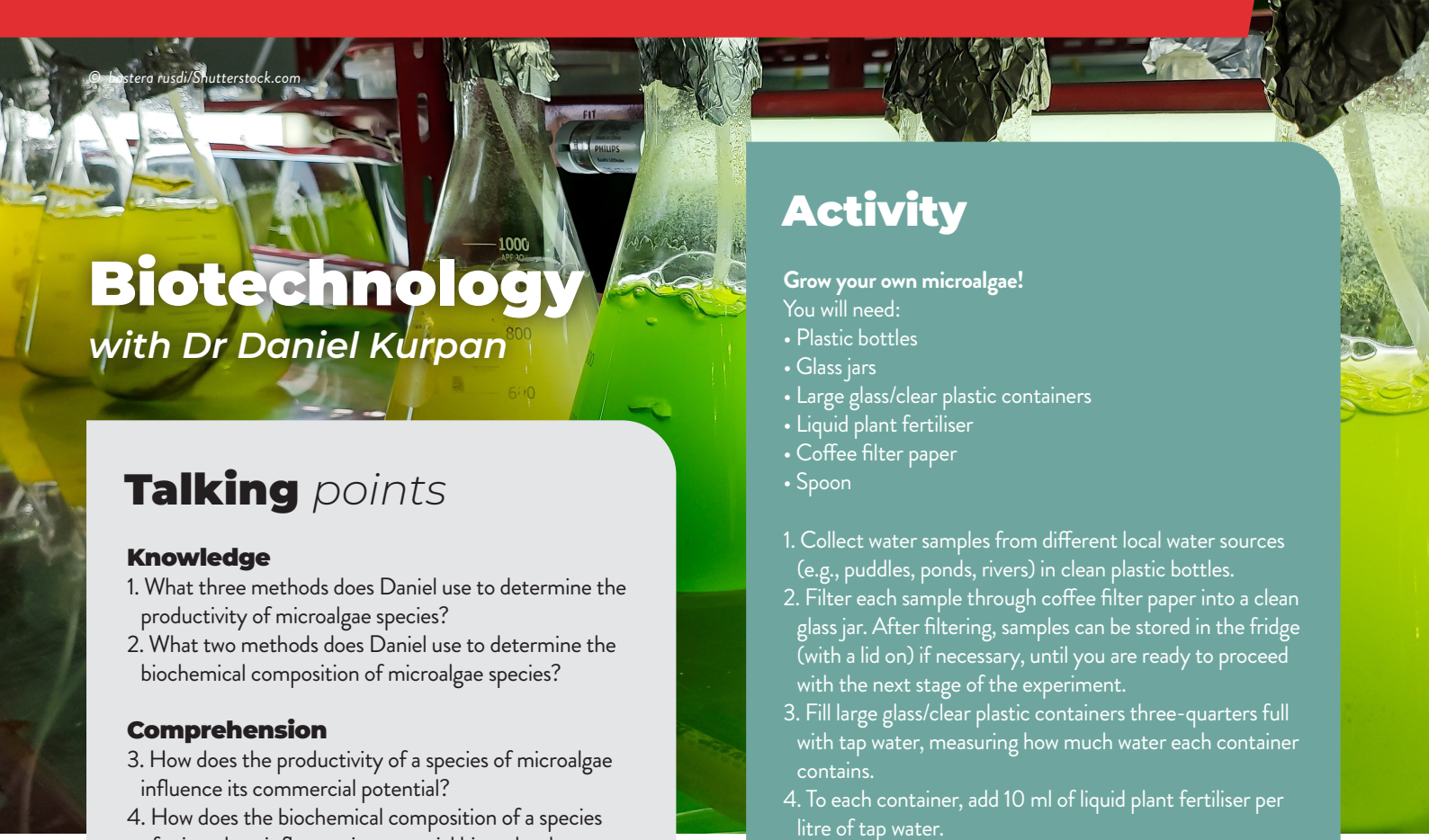

Biotechnology

with Dr Daniel Kurpan

Talking *points*

Knowledge

1. What three methods does Daniel use to determine the productivity of microalgae species?
2. What two methods does Daniel use to determine the biochemical composition of microalgae species?

Comprehension

3. How does the productivity of a species of microalgae influence its commercial potential?
4. How does the biochemical composition of a species of microalgae influence its potential biotechnology applications?

Application

5. What scale-up feasibility analysis and animal acceptance tests do you think scientists need to perform before *C. saccharophilum* and *T. brasiliensis* can be used as animal feed?
6. In addition to those mentioned in the article, what other biotechnological applications do you think microalgae could be used for?

Analysis

7. Why do you think it is a problem if biotechnology companies use microalgae species that are not adapted to grow in local conditions?

Creativity

8. Macroalgae – or seaweed – is commonly eaten in many places around the world, but currently microalgae is still considered an unusual food by most people. After all, the scum growing on the surface of a pond doesn't look very appetising! How would you design a campaign to encourage people to adopt microalgae in their diets?

Activity

Grow your own microalgae!

You will need:

- Plastic bottles
- Glass jars
- Large glass/clear plastic containers
- Liquid plant fertiliser
- Coffee filter paper
- Spoon

1. Collect water samples from different local water sources (e.g., puddles, ponds, rivers) in clean plastic bottles.
2. Filter each sample through coffee filter paper into a clean glass jar. After filtering, samples can be stored in the fridge (with a lid on) if necessary, until you are ready to proceed with the next stage of the experiment.
3. Fill large glass/clear plastic containers three-quarters full with tap water, measuring how much water each container contains.
4. To each container, add 10 ml of liquid plant fertiliser per litre of tap water.
5. To each container, add 20 ml of one of your water samples per litre of tap water, making a note of which container contains which water sample.
6. Use a spoon to mix the contents of each container.
7. Place the containers in a well-lit place (e.g., on a windowsill or near artificial lights).
8. Observe the changes in each container over a few weeks as your microalgae grow. For example, note how the colour in the container changes with time and, if possible, record the appearance of the microalgae under a microscope at regular intervals.
9. Why does the water in the container turn green? After a few weeks, why does the green colour disappear? Do you observe any differences between the containers containing different water samples? If so, what do you think is causing those differences?
10. Once the colour of a container turns anything other than green, empty it down a drain or onto grass. If the initial growth in a container is anything other than green, do not continue with that experiment as non-algal microorganisms may have colonised the tank.

More *resources*

- Visit Daniel's Futurum page to read his article in Portuguese: **futurumcareers.com/uncovering-the-biotechnological potential-of-microalgae**
- Agroscope explains why microalgae are a good alternative source of protein: **agroscope.admin.ch/en/microalgae-a sustainable-protein-alternative**

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www.lidl.ch

+44 117 909 9150
info@futurumcareers.com
www.futurumcareers.com

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