

MOLECULAR BIOLOGY AND BIG DATA WITH DR KIM HAMMOND-KOSACK

TALKING POINTS

- 1) Which vegetable can be infected with disease by *Phytophthora infestans*? What is the name of the disease? What effect did the disease have on the population of Ireland between 1845-1851? (See *Five deadly plant pathogens*, p3)
- 2) What are the three kinds of disease-causing organisms in the PhytoPath database? Give an example of each kind. (See *What kind of organisms cause plant diseases?*, p1)
- 3) Why is it hard to predict where new outbreaks of disease will occur? (See *What's the problem*, p1)
- 4) How did *Colletotrichum kahawae* change the drinking habits of people in Britain in the nineteenth century? (See *Five deadly plant pathogens*, p3)
- 5) Describe the scientific discovery, made in the 1980s, that showed how a virulent (disease-causing) bacteria could be converted into one that didn't cause a disease. (See *What was the key discovery in your field of research?*, p3)
- 6) Imagine that you're a government scientist with the job of preventing diseases from destroying valuable food crops. Name two ways you could do this.
- 7) What diseases can *Alternaria alternata* cause in humans? (See *Can studying plant diseases improve human health?* p2)
- 8) Why has collecting genetic data become a big challenge? How is the problem being solved? (See *What are the challenges involved in this kind of research?*, p2)
- 9) Not all plant pathogens have unwanted effects. Why do wine producers like *Botrytis cinerea*? (See *What kind of organisms cause plant diseases?*, p1)

ACTIVITIES YOU CAN DO AT HOME, SCHOOL OR COLLEGE

PLANT DISEASE DETECTIVES

In this activity, you'll act as a detective to identify a series of common plant diseases. You'll piece together information for each disease, such as the type of pathogen, ways in which the disease spreads, and methods of preventing it from spreading. This activity is intended for school, but once you've got the hang of it you could investigate plants growing in your garden or local park.

Find the downloadable teacher notes resource at the following link, which includes the case notes for five plant diseases:
<http://saps.org.uk/secondary/teaching-resources/1362-plant-disease-detectives>

INTRODUCING PLANT GENETICS

Explore more about the genetics of plants and other organisms at this site, which is full of information and activities. They include a virtual lab to conduct experiments, such as how to extract DNA:
<https://learn.genetics.utah.edu/>

SHOW WHAT YOU KNOW ABOUT PLANT PATHOGENS

Create a presentation about three different plant pathogens in PhytoPath. Find pathogens that infect three common food crops. Describe the diseases caused by each pathogen and the host plant species they infect. Include screenshots of PhytoPath and PHI-base showing how to get more information on the genes of your chosen pathogens: <http://www.phytopathdb.org> and <http://www.phi-base.org>