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Speaking about charging – have you ever seen a lion charging an ostrich? That is an extremely fast race. Discover the secret of the fastest flightless bird (page 12). In Europe, we rarely have to run for our lives as ostriches do, but when we need to get anywhere in a hurry, we often seem to get stuck in a crowd. How can physics help us to understand and control crowd behaviour, and how can we investigate it in the classroom (page 23)?

Crowds are prone to form when we try to squeeze through small gaps such as exits. On a smaller scale, molecules also move through small gaps as they pass through membranes – a phenomenon that is essential to kidney dialysis and can be investigated simply at school (page 28).

Dialysis is a well-understood procedure, but medical treatments are not always easy to explain. If you take a tablet and get better, was it really the drug or could it have been the colour of the tablet – just a placebo effect? This effect is no mumbojumbo, but a real physiological phenomenon (page 52).

Staying with the topic of medicine, Massimiliano Mazza tells us about a new idea of how tumours could be formed that may lead to new treatment strategies: cancer stem cells (page 18). The first reports of tumours date back to ancient Egypt. Following in the steps of ancient scientists, chemistry teacher Gianluca Farusi shows us how to prepare Julius Caesar's favourite perfume (page 40).

To create perfume, you can extract aromatic chemicals from plants – but extraction can also work in the other direction: some plants can remove poisonous chemicals from polluted soil or water, such as the aquatic fern *Azolla*. Vered Yephlach-Wiskerman uses it in a classroom project on bioremediation (page 36).

Air pollution can also be a problem, caused not only by obvious sources such as cars or industry, but even by something as beautiful as fireworks. Using freely available databases, this and other aspects of air pollution can be investigated in the classroom (page 47).

While we're looking at the sky, do you remember when the Solar System used to have nine planets? Astronomer Mike Brown played an important role in the reclassification of Pluto as a dwarf planet (page 6). He based his observations on the visible part of the electromagnetic (EM) spectrum, but other astronomers analyse X-rays and gamma-rays from space (page 57). Finally, right at the other end of the EM spectrum are radio waves. If you tune into them at just the right frequency, you may catch Swiss chemistry teacher Marco Martucci on air with his science show. Read the interview with him online, where you will also find our book reviews and further materials (www.scienceinschool.org).

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