From industry 4.0 to lab 4.0

Innovations from the 'third industrial revolution' are already making a huge impact in the lab. ImageJ is now over 20 years old and software to aid in lab work is becoming increasingly more advanced and attainable – one example can be seen in this issue, where Bates *et al.* have created a smartphone app for quantitation of complex images that can be used to analyze large amounts of data and in citizen science capacities. Software such as this are crucial now that a common bottleneck in research is the enormous quantity of data that can be produced by new tech – a common theme at scientific meetings is how to analyze it effectively.

These innovations are moving us into the fourth industrial revolution, or 'Industry 4.0' – that is, harnessing the technological innovations of the third revolution and converging digital, biological and physical concepts in systems. One example of this was seen in work on directed evolution of enzymes, opening up new ways to make pharmaceuticals and environmentally friendly chemicals. Frances Arnold shared the Nobel Prize in Chemistry for this in 2018. With the impact of lab work on the environment clearly a problem (as discussed in our January 2019 issue), this 'biologicalization of manufacturing' is an exciting new prospect.

Overall, Industry 4.0 promises to further our understanding of biology immensely, and enable us to revolutionize our research methods – I can't wait to see more coming across the *BioTechniques* news desk on this topic.

“... this 'biologicalization of manufacturing' is an exciting new prospect.”

Francesca Lake

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