

Focus on single-cell technology

Single-cell technologies are providing biologists with a more granular picture of cell biology and complementing data from traditional bulk population studies. In recent years, a slew of novel cytometry techniques have been added to traditional electrophysiological, sorting and imaging methods for making measurements at multiple time points in individual cells. In particular, increasingly sophisticated microfluidics and high-throughput nucleic acid sequencing has transformed analysis of DNA, RNA and chromatin profiles in single cells, and mass cytometry has enabled the simultaneous measurement of multiple protein markers and metabolites.

To date, a diverse array of detection and analytical technologies has been applied to understand heterogeneity in tumor cells, immune cells and neural cell types. Although cancer, immunology and neuroscience have witnessed the greatest application of single-cell approaches, other areas of the life sciences, such as bacteriology and virology, also increasingly stand to benefit [Editorial, p. 1077].

Elsewhere in the Focus, a News Feature looks at commercial interest in the potential of liquid biopsies in both cancer patients and individuals at higher risk of disease [News Feature, p. 1090]. On page 1111, we ask a group of experts from different fields their thoughts on a range of issues relating to where single-cell technologies are today and how they foresee them being advanced and applied in the future [Feature, p. 1111]. The use of cantilever sensors for measuring cell mass is also discussed [News and Views, p. 1125].

Although snapshot analyses of thousands of single cells are powerful, interest is growing in the potential to analyze a few single cells over extended periods of time. A Perspective by Timm Schroeder and colleagues discusses the challenges, and provides some solutions, to long-term continuous imaging of single cells [Perspective, p. 1137]. Finally, single-cell technology is enabling researchers to rethink conventional definitions of cell type and to envision the creation of a comprehensive atlas of human cells. Focusing on RNA-seq, Aviv Regev and colleagues review computational approaches for analyzing single-cell data to uncover the nexus of biological factors that constitute cellular identity [Review, p. 1145].

The Editors



Patent roundup

Since the US Supreme Court's decision in the case *Association for Molecular Pathology et al. v. Myriad Genetics, Inc.* in 2013, ruling against the patenting of natural DNA, the repercussions have been felt across the industry. A Feature looks at the striking and unforeseen implications of the case [Patent Article, p. 1119]. MF

Recent patent applications in oligonucleotide therapeutics. [New Patents, p. 1124] MF

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