A scanning electron micrograph (SEM) showing numerous Mycoplasma mycoides JCVI syn1.0 cells. The cells are pleomorphic, appearing as irregular, rounded, and elongated structures with a textured surface. They are distributed across a blue background.

Tools to Engineer the Genome

BioTechniques Focus

Advances in genetic engineering techniques and methods have led to breakthroughs in scientific disciplines such as synthetic biology. For this special BioTechniques Focus section, the editors have selected two articles describing methods and applications for engineering large sections of DNA. First, in a special news feature, editor-in-chief Nathan Blow details the history of synthetic gene circuits, and speaks with several researchers who are engineering novel synthetic circuits in cells for applications ranging from logic computation to metabolite production. In our second article, a team of researchers from Malaysia describe a new methodology for directed evolution of nucleotide libraries that bypasses many limitations found in traditional random mutagenesis and DNA shuffling approaches. We hope these articles provide all readers with a better sense of the latest advances in genome engineering technology, as well as a clearer understanding of how these tools are being used in modern synthetic biology.

SEM image of Mycoplasma mycoides JCVI syn1.0, courtesy of Thomas Deerinck and Mark Ellisman, NCMIR and John Glass and J. Craig Venter, JCVI.

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doi 10.2144/000113964