

PixelBio - Executive Summary



*Genetic testing for any
species, any organisms,
any genes™*

Business Summary PixelBiotech GmbH is a German startup building AI-powered single-molecule genetic testing technologies and platforms. Being the inventor of the industry's first true multiplex single-molecule Fluorescence In Situ Hybridization (HuluFISH) probe and an AI-powered data analysis platform, our mission is democratizing genetic testing by making it precise, universal, affordable and accessible. We are a spinoff from Germany Cancer Research Center (DKFZ).

Customer Problem Many important healthcare or related industries are underserved by today's genetic technologies due to high cost, low accuracy, or poor usability. In food safety, the outbreak of African swine fever has cost \$300M+ loss to the Chinese pig farmers in 2018. In cell and gene therapy, a low-cost, precise solution for continuous molecular profiling and outcome monitoring is missing. In the vaccine industry, recent accidents and lawsuits have raised the need for affordable and high throughput vaccine quality control tools.

Technology We lead the industry in developing highly generic, very affordable, multiplexing smFISH probes. Our proprietary smFISH technology *HuluFISH* provides precise gene expression profiling at a single molecule level and costs 1,000x less than NGS. We also developed a comprehensive AI-powered data analysis platform that is 3000x faster than humans, effectively eliminating the gap between data and discovery.

Products 1) The *HuluFISH Kit* is the industry's first true multiplexing smFISH probe kit that detects multiple biomarkers in a single hybridization reaction. Our probe design is programmatic, allowing for full customization of combinations of genes. 2) *HuluREAD* is an AI-powered cloud platform for HuluFISH data analysis. HuluREAD features deep learning, 2D/3D image segmentation, quantitative feature extraction, statistical analysis, and automated reporting. HuluREAD provides a high level of quantitative standardization and removes tens of hours of manual labor per experiment.

Initial Target Markets We tackle the \$20 billion global genetic testing market with three initial targets. First, we are developing a single molecule level diagnosis and prognosis tool for cell and gene therapies. Our pilot data with CAR T-cell has shown the industry's first successful detection of CAR gene expression in human T cells at single-molecule precision. Second, we are developing a universal and high-throughput pathogen detection platform for food safety. The first use case is African Swine Flu (ASF) detection for the China market. Third, we continue supporting academic and

corporate single-molecule and single-cell research for revenue generation, application discovery, and branding.

Customers During presale we have reached €70,000 revenue from 20 paying customers. Our customer base shows diverse regions (Germany, Sweden, Italy, Switzerland, China) and applications (cell biology, biochemistry, single-cell genomics, cell therapy, cancer biology, microbiology, etc). HuluREAD has processed terabytes of customer data acquired from a variety of microscopes incl. Zeiss, Leica, Nikon, Andor, etc.

Business Model (Stage 1) For academic and corporate research, we sell customized HuluFISH probes bundled with HuluREAD at half the price of competitors, yielding a 70%+ margin. (Stage 2) For clinical and industrial applications, we develop and deploy end-to-end testing devices with probe subscription for 50%+ margin at a much larger volume.

Competition Our main competitors are mainstream genetic testing technologies and other FISH suppliers. NGS generates omic-level genetic data yet is very expensive, while immunostaining and PCR are more cost-effective but can only detect at most a dozen of biomarkers in a single reaction. Traditional FISH technologies suffer from very limited throughput and do not offer data quantitation service.

Competitive Advantages 1) Access to one of the largest cancer biology sample/data banks in the world; 2) inventor/owner of generic, affordable, multiplexing smFISH probe technology with global IP protection; 3) the only FISH supplier offering free AI-powered data quantitation service; 4) provide 10x throughput at half the price of the closest competitor; 5) top-notch team consisting of experts in the single-molecule probe, the microscope, AI and cell therapy.

Founders 1) *Yang-Sheng Cheng*, HuluFISH inventor, 10+ year biotech R&D, 10+ papers incl. Nature; 2) *German Cancer Research Center*, top biomedical R&D institute, two Nobel laureates in the past 10 years. 3) *Dr. Xinghua Lou*, 10+ year AI and data science R&D, international best paper winner, 30+ papers incl. Science, NIPS, ICML, CVPR, MIT Press.

Advisors 1) *Prof. Dr. Dirk Jäger*, Managing and Medical Director of the National Center for Tumor Diseases, Germany, Head of the Medical Oncology Department at the Heidelberg University Medical Center. 2) *Prof. Lidai Wang*, an expert in biomedical instrumentation, inventor of single-cell flowoxigraphy (FOG).

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