Development of Major Enterprises

In 2015, there were approximately 21,100 thousand industrial enterprises in this region. Among them, 1,630 have reached considerable scales, including one 100-billion-giant enterprise, three 10-billion-giant enterprises, and 397 100-million-giant enterprises. Many are famous nationwide namely Media, Galanz and Country Garden, etc. Currently, there are 18 public listed enterprises, and 27 listed in new tertiary board.

Major Economic Indicators

In 2015, the GDP of Shunde has reached 258.7 billion yuan, increased by 8.5%. The industrial output value of enterprises with 20-million-turnover has reached 629.71 billion yuan, increased by 8.0%. The total import and export value has reached 257.7 billion USD and the foreign investment in actual use has been 930 million USD.
Located in the Pearl River Delta, Shunde is close to Guangzhou, Shenzhen, Hong Kong and Macau. With a total area of 806 km², she is one of the most famous manufacturing hub in that region. Shunde is also considered as one of the “Four Tigers in Guangdong”. She was ranked No. 1 in “Top 100 cities in China” for 4 consecutive years from 2000 to 2003, and No. 1 in “Top 100 Districts in China” for 4 consecutive years from 2012 to 2015, attracting investments all over the world. Currently, there are 2029 foreign-invested companies and 97 representative offices in Shunde. Over 40 independent enterprises were established by 29 enterprises of the Fortune 500. In 2016, Media Group is listed in the Fortune 500 for the first time, making it the first Foshan-originated enterprise stepping in the Global 500, as well as the first Chinese-originated enterprise specializing in household appliances on the Global 500 list.

![Output Value of 8 pillar industries in 2015(billion Yuan)](image)

<table>
<thead>
<tr>
<th>Industry</th>
<th>Output Value (billion Yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machinery &amp; Equipment</td>
<td>209.9 (33.3%)</td>
</tr>
<tr>
<td>Household Appliances</td>
<td>244.7 (38.9%)</td>
</tr>
<tr>
<td>Germents &amp; Textiles</td>
<td>18.6 (3.1%)</td>
</tr>
<tr>
<td>Electronic Communication</td>
<td>24.8 (3.9%)</td>
</tr>
<tr>
<td>Fine Chemicals</td>
<td>17.5 (2.8%)</td>
</tr>
<tr>
<td>Furniture Manufacturing</td>
<td>9.1 (1.4%)</td>
</tr>
<tr>
<td>Packaging &amp; Printing</td>
<td>4.1 (0.65%)</td>
</tr>
<tr>
<td>Medicine &amp; Healthcare</td>
<td>1.7 (0.27%)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>531.4</strong></td>
</tr>
</tbody>
</table>

### Development of Major Industries

In 2015, the ratio of primary, secondary and tertiary industries in Shunde is 1:58:5:40:0. The major industries in Shunde include household appliance, machinery equipment, electronics, IT, textile, garment, advanced chemical engineering, packaging, printing, furniture manufacturing, automotive accessories, pharmacy, and healthcare. The two dominating industries in our district are household appliances and mechanical equipment, with annual production of 224.7 billion RMB and 209.921 billion RMB respectively, growing at a rate more than 5% per annum. Nowadays, industrial robots are the most important component of intelligent equipment industry. In recent years, the development of industrial robots in Shunde market has increased by leaps and bounds, and many robotic enterprises have gathered in Shunde. KUKA Robotics China (Shanghai) Ltd has constructed the Robotic Application Engineering Center as well as more than 6 supporting robotics enterprises in Sino-European Services Center of Foshan New City.

With a comprehensive approach to the robotic equipment industry, the Media Corporate and Yaskawa Japan founded a robotics company in March this year. This company will focus on the manufacturing of industrial robots and service robots, and it is expected to be in production in October. Apart from holding 94.5% stock of KUKA Robotics Company, Media has become the second largest shareholder of Anhui Effort Robotics Company.

After introducing Fanuc Robotics into Sino-European Services Center, the Fanuc Robotics Engineering Application Center in Shunde was established. Moreover, LXD Robot System Company Ltd, ABB and COMAU have signed the strategic cooperation agreement and carried out collaborations in research and development as well as constructions.

In addition, LS Robotics Company cooperated with Kawasaki Heavy Industries Ltd to build the Application Engineering Center for White Appliances and Industrial Robots, as well as Training Center of Kawasaki Robot in South China. They have become the largest executive agent and cooperative partner of Kawasaki in South China. Anhui Effort Intelligent Equipment Company Ltd is also looking forwards to establishing an integrated plant for robotic system in Shunde and entering the Huayin Robotic Industrial Park.
Detection and quantitation of proteins in biological samples is an essential task routinely performed in countless disciplines and in laboratories all over the world, for activities ranging from basic protein characterization to clinical diagnostic testing and drug development. Common methods for protein detection include enzyme-linked immunosorbent assay (ELISA), dot blot, and Western blot (also called protein immunoblot).

While these standard assays continue to present a reliable means of cell analysis for thousands of targets, recent advances in instrumentation offer significant improvements in time savings and convenience for common markers. An additional limitation of bulk assays is the need to homogenize cells or tissue, resulting in a loss of information from individual cells in a population. Techniques that detect and report signal from individual cells can provide quantitative data from large populations about protein target or other marker levels, from cells of varying phenotype, developmental state, or health status.

Quantitative data from large populations with single-cell precision

Flow cytometry addresses this need for quantitative data from significant cell populations by interrogating individual cells for the presence and relative strength of signal from fluorescent reagents or antibodies. However, traditional flow cytometers require extensive operator training and expertise, and sheath fluid-based systems are characterized by extensive setup and shutdown—as well as considerable cost to purchase, operate and maintain.

The Muse® Cell Analyzer was developed to give researchers simple, affordable access to the quantitative data that flow cytometry provides for measuring markers of viability, mitochondrial health, protease activity, and more. Built on flow cytometry principles, Muse® uses microcapillary fluidics and pre-optimized reagents to create an inexpensive, compact, portable system that requires little setup and no expertise to operate. These attributes present a rapid, simplified alternative to more time-consuming methods like Western blot (that may also demand considerable technical expertise) for routine analysis of cell culture health, and to assess the effects of compounds for toxicology and drug discovery screening.

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### Table 1. Workflow comparison among protein detection methods.

<table>
<thead>
<tr>
<th>Method</th>
<th>Key materials and equipment needed</th>
<th>Hands-on time</th>
<th>Typical total assay time: From cells to data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ELISA</strong></td>
<td>Coated multwell plates, Capture antibody, Detection antibody conjugate, Enzyme substrate, Stop solution, Plate washer, ELISA reader</td>
<td>1.5 hours</td>
<td>8 hours – 2.5 days</td>
</tr>
<tr>
<td><strong>Dot blot</strong></td>
<td>Blot cassette, Blocking buffer, Nitrocellulose membrane, Protein standard, Primary antibody, Secondary antibody, Detection reagent</td>
<td>1.25 hours</td>
<td>5.5 hours</td>
</tr>
<tr>
<td><strong>Western blot protocols</strong></td>
<td>Lysis buffer protein quantification kit, Protein standards, SDS page gels, Electrophoresis chamber, Loading buffer, Running buffer, Transfer buffer, Protein transfer chamber, Membranes, Filter paper, Blocking buffer, Primary antibody, Secondary antibody, Gel/blot imager</td>
<td>2 – 3 hrs</td>
<td>10 hrs – 2.5 days*</td>
</tr>
<tr>
<td><strong>Muse®</strong></td>
<td>Muse® MultiCaspase Assay kit (Cat. No. MCH100109) for detection of the activity of caspases 1, 3, 4, 5, 6, 7, 8, and 9. Results from this assay are available in approximately one hour, about 20 minutes of which requires hands-on activity.</td>
<td>10-15 mins</td>
<td>10 mins – 4 hrs.</td>
</tr>
</tbody>
</table>

**SUMMARY OF PROTOCOL**

Culture cells, including negative and positive controls, for time needed to induce apoptosis.

- Dilute Muse® 10X Caspase Buffer to 1X with DI water.

- Prepare cell samples in 1X Caspase Buffer for incubation with Muse® MultiCaspase Reagent working solution.

- Reconstitute Muse® MultiCaspase Reagent with 50 µL of DMSO to make stock solution.

- Dilute Muse® MultiCaspase Reagent stock solution 1:160 with 1X PBS to make working solution.

- Prepare Muse® Caspase 7-7-AAD working solution by adding 2 µL of 7-7-AAD to 148 µL of 1X Caspase Buffer.

- Add 5 µL of Muse® MultiCaspase solution to 50 µL of cells.

- Add 150 µL of 7-7-AAD working solution.

- Mix thoroughly and run on Muse® Cell Analyzer.

- Incubate at 37°C for 30 minutes.

**Figure 1.** Typical Muse® assay experimental protocol summary. Steps shown are from the protocol for the Muse® MultiCaspase Assay kit (Cat. No. MCH100109) for detection of the activity of caspases 1, 3, 4, 5, 6, 7, 8, and 9. Results from this assay are available in approximately one hour, about 20 minutes of which requires hands-on activity.
Population means vs. individual cell quantitation

Data that can be quantified are increasingly important in the life sciences, as quantitative data are objective and therefore considered more reliable, as well as being subject to statistical analysis. Quantitative data are assumed to be more representative of populations than qualitative data, and therefore must be characterized both by significant sample size and by the capacity to measure individual events in a sample.

Figure 2. Common bulk immunodetection assay results contrasted with quantitative data. A. Enzyme-linked immunosorbent assay (ELISA), left panel, uses a colorimetric or a fluorescent detection reagent. Spectrophotometry can be used to transform signal intensity into numerical values, but signal intensity is a mean from all cells or cell products in a sample, as is the case with dot blot (middle panel). The right panel is an example of fluorescent detection of immunoblot (Western blot), showing the ‘ladder’, or molecular standard, in lane 1. B. Left panel, Western blot of recombinant histone H2AX (lane 1), recombinant histone H2A (lane 2), and acid extracted proteins from HeLa cells (lane 3) were probed with anti-histone H2AX. The right panel shows representative data from the Muse® H2AX activation dual detection assay, which uses two directly conjugated antibodies against the unmodified and phosphorylated histone target to map signal from every cell in the sample onto a scatter plot. Absolute numbers and percent of cells activated in the sample are automatically calculated and displayed on the ‘Statistics’ tab.

Although spectrophotometry and densitometry can be used to transform sample well color or the size of a blot or band into numerical values for comparison of relative signal intensity among samples, these methods rely on homogenization of all of the cells or tissue in a particular sample. Western blot relies on concurrent electrophoresis of a mixture of proteins of known weight to create a standard, or ‘ladder’ of bands on the blot, to which positive bands from sample lanes are compared for confirmation of the protein’s identity [Figure 2A, right panel]. Because no identity information can be gained from immunoblot without the standard for comparison, Western blot is considered ‘semi-quantitative’.

Conclusions

Immunoblot and immunosorbent assays continue to be among the most popular methods for protein detection in the life sciences, as they are amenable to measuring virtually any target for which an epitope binder such as an antibody can be developed. These methods are constrained, however, by the inability to capture population variation due to the homogenization of sample. Standard bulk methods may also not be optimal for routine screening because of the time they consume in the lab and the expertise they require in order to optimize reagents and to obtain, interpret, and troubleshoot results.

Simplified flow cytometry-based analysis presents a rapid, uncomplicated, cell-based alternative to methods such as immunoblot, particularly for routine and frequent screening of cell cultures, or for response of cell models to compounds in development for chemotherapeutics, drug discovery, cosmetics and similar applications. In addition to detecting key protein targets, The Muse® system incorporates assays for detection using familiar cell status indicators that do not rely on antibody-protein interactions, such as fluorescent membrane integrity dyes and nucleic acid binders.

The Muse® software automatically returns cell-by-cell results from these reagents, unlike microscopy or other low-throughput, time-consuming or subjective techniques for measuring their signal. Muse® assays are selected to provide an efficient means for the most essential viability, cell health, and signaling screening, and reagents are pre-optimized to minimize variation and the need for complex setup adjustments that characterize traditional open-system cytometers.

Despite its small size and remarkably simplified operation, the Muse® system returns the same powerful single-cell data as larger, more costly and complex systems. The availability of rapid, quantitative cell analysis without the need for extensive investment in supplies or trained personnel has the potential for significant impact on compound screening and cell culture model paradigms in the pharmaceutical and life science research domains.

To learn more about the Muse® Cell Analyzer and see a complete list of Muse® assays, please visit: [www.emdmillipore.com/muse](http://www.emdmillipore.com/muse)

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ZHEJIANG UNIVERSITY CALLS FOR GLOBAL TALENTS

Brief Introduction of Zhejiang University

Located in the historical and picturesque city of Hangzhou, Zhejiang University is a prestigious institution of higher education with a long history. After a hundred years of construction and development, Zhejiang University has become a comprehensive research university with distinctive features and relatively great impact at home and abroad. Research at Zhejiang University spans 12 academic disciplines, covering philosophy, economics, law, education, literature, history, art, science, engineering, agriculture, medicine, management and etc. In all 22 disciplines of FSI, there are 18 disciplines leading to top 1% in the world. Zhejiang University has always been committed to cultivating talent with excellence, advancing science and technology development, serving for social well-being, and promoting advanced culture with the spirit best manifested by the university motto “Seeking the Truth and Pioneering New Trails.” Zhejiang University has long been holding the educational philosophy of putting people foremost, cultivating students in an all-round way, seeking the truth and pioneering new trails in search of excellence, and is committed to cultivating future leaders with an international perspective.

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Know More of Our Talent Programs

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Zhejiang University sincerely invites excellent talents to join us and together to create a glorious future for Zhejiang University and its people.

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- How to Apply

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- Qualifications and Requirements

Candidates are expected to be about 35 years old. Successful applicants should hold a doctoral degree of world-renowned university and postdoctoral experiences are preferred. Successful applicants are supposed to work full-time and deliver excellent research and teaching at ZJU. The spirit of “Seeking the Truth and Pioneering New Trails” are expected.
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