Interview: Jane Papadaki Markley – General Manager EMEA, Wafergen Biosystems Europe, Luxembourg

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The General Manager EMEA of Wafergen Biosystems discusses the revolutionary nature of the company's technologies, how they are at the new frontier of genomic research, why Wafergen set up its EMEA office in Luxembourg, growth hotspots in the EMEA region, and the recent merger with Japanese group Takara Bio.

To begin, could you please introduce Wafergen and its proprietary technologies?

Wafergen was birthed in the Silicon Valley in 2003, and is a high-tech company in spirit. The founders developed a way to do very high throughput PCR analysis on the basis of what we now call a SmartChip™. This is a chip with an array of nanoliter wells on the surface in which reactions can take place, and this is the basis of most of our systems.

In 2007 Wafergen went public and then in 2010 we launched our first product, which was used for high-thoughput qPCR. The next year in 2011 this Luxembourg subsidiary was established, although it was relatively inactive for the first few years. In 2013, we launched an NGS target enrichment application using the SmartChip platform. Later we acquired a system used for library preparation from another company.

To be clear, Wafergen's products do not perform gene sequencing. Rather, we focus on other parts of the workflow for next-generation sequencing applications. We fit the trend in the sense that the actual sequencing market is dominated by just a few large companies, ThermoFisher and Illumina

especially, and as such startups focusing on genomic analysis tend to bring innovations in the workflow and applications side rather than the core sequencing technology.

Are these technologies revolutionary in the field of genomic analysis?

The latest and most revolutionary technology we have introduced is the ICELL8™ Single-Cell system, which is an application of our SmartChip technology used for single cell isolation and analysis. Single cell sequencing opens up a whole new area of development because the data generated is so much more precise. With normal sequencing methods, the observed genome is effectively the average genome of the cells in the sample – as such you can't observe the variations between the cells. With single cell sequencing you are able to observe these small differences, and identify different cell populations or low-level mutations. This sort of precision is very useful if you are studying how cells or cell populations evolve, or aspects of how a disease progresses. This is really the new frontier of genomic research.

Now, single cell isolation can be done manually using other platforms, but this has obvious limitations on the number of samples that can be prepared and then sequenced. Our ICELL8 technology effectively supercharges this process making it possible to run thousands of single cells per day. You can also select specific cells of interest to process. As such, with this technology, as well as the rest of our portfolio, Wafergen is a really powerful contributor to the explosion of genomic analysis.

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The NextGen sequencing market is expected to reach USD 8.8 billion by 2018, versus just 2.5 in 2014. What do you see as the main markets driving this growth?

The marketplace for high throughput sequencing systems is largely dominated by the academic life sciences community, as these are the types of institutions handling very large volumes of samples pursuing basic research topics. This is the market we have usually focused on feeding our products into to date, as the potential demand from clinical researchers or the pharmaceutical industry is not as great. That said, we now have an application for immune system profiling, meaning T-cells and with the huge growth of the immune-oncology market, many biopharma companies have expressed an interest in this new system and novel application.

Geographically, the interest in the single cell sequencing has been higher in Europe than the US, and the associated research and technologies have taken off a bit quicker here than in the US. This is because there are more opportunities for testing here, with many of the big European academic

centers and research institutions already doing a lot of large single cell analysis projects.. Although the US marketplace is potentially much larger than Europe, our experience has been faster adoption in Europe.

Within Europe, Germany, France, the UK, Scandinavia and Benelux are the main hotspots for genomic research. Spain and Italy are not really on the map. In the Middle East, we have seen interest in the UAE, Qatar, and Yemen; while we haven't looked into Saudi Arabia, there are several centers there that could support the use of our equipment. Otherwise, South Africa is likely the only country in Africa ready to support the sales of many of our systems.

What are some of the challenges you face in this EMEA region?

One challenge is that the purchases are usually made with grant money or other forms of public funding; neither we or our direct clients control this. Sometimes a center might want to buy our system, apply for funding, but then it doesn't come through. When it does come through, it takes quite a lot of time for such applications to come through and the funding to materialize, and since public funding can be cyclical sales can be quite volatile.

Another challenge can come from customers who want to test the system before buying – this takes a lot of time too. Since our technologies don't actually perform the sequencing, many groups say they will do the sequencing themselves; often this means they will arrange it and have to wait in queue for weeks or even months. Sometimes we step in and help and organize for it to be sequenced to move the process forward. However, the sequencing results can be difficult to interpret, so at the end it may be somewhat unclear because this is groundbreaking research where the true answers are unknown; even if they are satisfied, there can still be delays in the procurement process.

One of the key question on our lips – why did Wafergen choose Luxembourg as its EMEA headquarters?

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Simply put, a very strong financial incentive package was offered. There are several sources of funding here in Luxembourg ranging from what are essentially non-competitive grants that companies can apply for and likely to secure with appropriate documentation, to larger competitive funding opportunities. Help is provided to fill out the relevant documents, and overall the bureaucratic delays are quite minimal. The facilities provided are also quite valuable for new start up operations which provided some shared services to minimize costs. We have also benefitted

from the proximity to Luxembourg Institutes of Health, LIH and International BioBank of Luxembourg, IBBL for collaborative studies and similarly the central location has been fortuous for collaborations with academic centres in neighbouring countries, that could easily visit our laboratory to run experiments

There are downsides too however. First, the flight connections to Luxembourg are not great by European standards; the number of direct flights to other European capitals is limited, and to get to a city like Prague for example can take all a full day.

Earlier this year Wafergen and Takara Bio announced a merger – what will this mean for the EMEA region?

We know that from a conceptual point of view it will be a great merger where our strengths will complement each other greatly. Wafergen has great engineering knowledge from working on large high-tech systems, while Takara Bio has much more experience with chemistry and applications and have a big R&D department in that area. But we don’t know much about what the merger will mean operationally.

Takara Bio already has an application for TCR profiling, which many of our prospective customers could use on the ICELL8 Single-Cell System. This is a very powerful combination and illustrates how we can leverage the newly merged organization, using the existing Takara customer base as prospective customers for the ICELL8 Single-Cell System and vice versa..

Personally, how successful do you feel you’ve been since you joined Wafergen here in Luxembourg?

Prior to my arrival, there was a fantastic team and a great opportunity, but it could have been managed better.

First of all, the managers prior to myself were European with limited exposure to American business culture, while our team in the US had limited experience working with Europeans; this was a recipe for poor communication, misunderstandings, and lost opportunities. For instance, headquarters never had a clear understanding of how significantly summer vacations impact business in France for instance, while here they are a simple fact of life that the previous managers didn’t think needed to be communicated to our teams. Second, the logistics were managed atrociously. While the operation here in Luxembourg could have handled importing devices into the EU and dealing with the paperwork, instead it was left to the institutions importing the equipment – for these academic and research institutions, they have limited experience dealing with these sorts

of challenges, and often a low level of English language skills. Together, these two challenges were enough to make the operation not really work; selling capital equipment is a challenge already and when the process doesn't move smoothly, it just falls apart.

So, upon my arrival, I identified these issues and have been working to correct them. Being a European who has lived in the US, for a large part of my career I understand the cultural differences well and was able to translate some of the issues to headquarters more effectively, and manage expectations more accurately. Sometimes the problem was as simple as emails which went unanswered or were answered incompletely, and as a result sales opportunities had slipped away before – all it takes is to follow up with a little bit of initiative in the American sense, although it can seem aggressive or impolite to Europeans, and it can be fixed. Second, we've fixed the logistics issues.

Together, with more basic team building and some other small changes, we have been able to increase sales dramatically; in Q1 2016 we sold more than all of 2015. So clearly we're on the path to success!

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