

Q&A with Mingjie Xie , M.Sc., M.B.A., CEO and Co-Founder of Rapid Novor Inc developing Next-Generation Protein Sequencing Technologies to Sequence Antibody Proteins



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Interview conducted by:
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CEOCFO: Mr. Xie, what is the focus behind Rapid Novor today?

Mr. Xie: Rapid Novor is a biotech company that is dedicated to developing the next-generation protein sequencing technology, more specifically, technologies to sequence antibody proteins. Our mission is to advance life science for better human health with next-generation protein sequencing.

CEOCFO: What is your approach and how might it differ from others?

Mr. Xie: When talking about sequencing, the first thing most people think about is DNA sequencing, where DNA or mRNA were sequenced and translated into the protein sequences. This is an indirect approach to sequence proteins and it requires the access to the cell line that generates the proteins. Our approach is to sequence the antibody proteins directly using mass spectrometry. It is a direct measurement on the actual functional molecule, the proteins. And because of this direct measurement, we are also able to detect unexpected variants, PTMs, glycosylation or any other things may happen to the protein but invisible to the DNA sequencing approach. All we need is a small amount of protein sample and we can directly "read out" the protein sequences.

CEOCFO: Are customers turning to you because they understand the difference in your approach, or is it the results that they look at and it does not matter how you get there?

Mr. Xie: Customers come to us for different reasons. For one, when the customer does not have access to the cell line, for example some of the customers developed their hybridoma cell line maybe 20 years ago. From so many years, so many freeze-thaw cycle, anything can happen to the cell line. Eventually the cell line may become contaminated or may even just die off. When they do not have the cell line, but still have some of the protein left, our technology is the only way to rescue their antibody so that they can keep using the exact same antibody they have been using for years.

CEOCFO: What types of projects do you typically work on? What are people looking for when they are testing?

Mr. Xie: Customers rely on us to accurately retrieve the sequence information from their protein samples. Most projects we take on are antibody sequencing projects. Occasionally, we receive projects to sequence non-antibody proteins. Our customers include researchers in the universities and pharmaceutical companies. They come to us for the sequence information of their protein sample. Those sequence information may help them rescue their antibody; research on higher order structure; research on the antigen the antibody binds to; or conduct further engineering on the antibody.

CEOCFO: Is the industry aware of Rapid Novor?

Mr. Xie: Although we are a young company, we already established our technology leadership in the field we play. Our co-founder and chief scientist, Dr. Ma, is the pioneer and leading researcher in protein sequencing using mass

spectrometry. In the past two years, the company has invested significant amount of time and efforts in trade shows and conferences to educate the market that technologies for 100% accurate direct sequencing of antibody proteins is not only possible, but also commercially available at an affordable price. More and more people are getting to know us because the value we provide is unique and the quality of our service is superior. We are the clear leader in this sector.

CEO CFO: *Would you tell us about your new facility?*

Mr. Xie: We have setup our own mass spectrometry lab in Kitchener Ontario, and we have purchased a Thermo Q Exactive Orbitrap mass spectrometer, which is a high mass accuracy instrument. This instrument is crucial to conduct the experiments that we need to do the sequencing work. This lab gives us a huge advantage compared to our competitors. Most of our competitors are either software people, who only do analysis on the data generated from experiments done by others; or experts on the experiments side, but can only use off-the-shelf software solutions. What we have is actually a combination of the two and this is critical to advance technologies, because not only our informatics or software people can make the best use of the data and design the best algorithms, but also we can feed the knowledge gained from the data analysis back to the experiment design to improve and optimize experimental protocols. The result of this bi-directional knowledge flow gives us better experiment data and in turn more sensitive and accurate technologies overall.

“We devoted ourselves to the development of the next-generation protein sequencing technologies and its application on antibody drug discovery and liquid biopsy. Going forward and long term that is the value Rapid Novor Inc will provide.”- Mingjie Xie , M.Sc., M.B.A.

CEO CFO: *What is it you provide and how is it different from what others offer?*

Mr. Xie: The sample coverage view on our website? That is a simpler version of the protein coverage view that is included in all of the sequencing report. Essentially, what this does is to give the customer a level of confidence of why the sequence we deliver to them is correct. It displays the antibody protein sequence, the annotation for the framework and CDR regions and the mapping of peptides observed from the experiments to the protein. In the general sense, the more overlapping peptides observed in the same region the more likely that region is correct. Internally, behind the scenes, we have a much more complex and robust platform, which not only provide a coverage, but also provide confident scores and many other detailed information for each every amino acid so that our scientists can quickly find out any issues with just subtle disagreement on the data.

CEO CFO: *Where does interpretation or the human element come into play or does the result come out directly from the equipment?*

Mr. Xie: That is a good question. At this moment, all of our reports are reviewed independently by two senior scientists. Essentially, our sequencing platform will help our scientist to quickly assemble the sequences, but because the sequence itself is crucial for the next step, most of our customers will get the sequence and then do the expression to make the antibody. Therefore, if anything is wrong in the sequence, the resulting antibody will not work. Right now the technology is not there yet to automatically give you a sequence that is 100% correct every time. Our philosophy is that we are responsible for what we deliver. So no matter how automatic our internal sequencing platform was already today, all the report will be reviewed by real scientists. To put this into perspective, two years ago it probably took each of the senior scientists a couple of days to finish one sequencing project. Now it only takes less than 2 hours per scientist. This is a huge improvement in terms of efficiency and the informatics automation. But what did not change, and will not change, is the human element of our service. You are assured to be in good hands of our scientists, not just computers.

CEO CFO: *How does pricing for your service compare with more traditional methods? Are people in the industry willing to pay for something better and faster?*

Mr. Xie: In terms of pricing there are two different comparisons. First, compared to those people who offer similar services to what we offer, we provide superior service with the most accessible price. This means we provide greater value compare to our competitors. We were able to achieve this through technology innovation, much more efficient sequencing platform, and lower cost structure. We have our internal lab, which is a significant cost saving to the project comparing to the outsourcing most of our competitors do. We have decided to pass this saving to our clients. The second comparison is to compare with DNA sequencing based technology, so if the customer has the cell line, they can choose to do the DNA sequencing or use our service. At this moment our technology is still significantly more expensive than the average DNA sequencing service provider. But there are already clients realize the value our technologies provide and willing to pay the higher price to complement the information they got from DNA sequencing. It is our intention to further lower the cost of our sequencing technologies in the next year or so, so that we can enter into the market segment dominated right now by the DNA sequencing technologies and make it available to more researchers.

CEOCFO: Are you seeking partnerships, investments or funding as you go forward?

Mr. Xie: We are actually right now in the fund raising mode. We are in talks with several investors and have gotten some interests. In terms of partnerships, in the past two years we have established very good partnerships with other companies in different verticals of the value chain. We are complimentary to each other's service. In that way each party gets help in advancing their company and technology.

CEOCFO: Put it together for our readers, many are in the healthcare community and investment community. Why pay attention to Rapid Novor?

Mr. Xie: Encoded by genes, proteins are the actual functional molecules in our body. Antibodies are a special type of proteins, which our immune system generates to protect ourselves from foreign agents. We devoted ourselves to the development of the next-generation protein sequencing technologies and its application on antibody drug discovery and liquid biopsy. Going forward and long term that is the value Rapid Novor Inc will provide.

