Cambly Mock Interview - 1

Questions for the Committee Interview

Hi Mike, you may ask me these questions for my mock interview. They are some academic questions for my PhD interview. Thank you very much!

Alex S :)

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1 What Prof. Liu’s lab does

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2 Why you are interested in joining Liu’s Lab

"In my previous research endeavors in transcriptomics and bioinformatics, I focused on uncovering patterns in gene expression, such as identifying NFIC as a transcriptional regulator for ischemic cardiomyopathy. However, throughout this work, I encountered several limitations inherent to traditional transcriptomics approaches. These include the averaging of gene expression data across a population of cells (sample from various heart cells, which may cause bias), which obscures heterogeneity; the inability to capture the dynamic and temporal changes in gene expression; and the challenge of distinguishing direct versus indirect effects of gene regulation.

Last year, in the end of 2023, Prof. Liu assigned a single cell multimodality project for me to finish. In that project, I learned a lot from the single cell genomic data. That technology impressed me with its specific and detailed measure of each cell data. In other words, it’s an elegant tech with more specified approach. It could potentially contribute a lot to our big dream of personalized medicine.

Furthermore, the scope of Professor Liu's lab extends beyond the realm of single-cell genomics. The lab uses cutting-edge technologies such as machine learning (ML) and artificial intelligence (AI) in genetic research. These advanced technological tools are powerful in unraveling more complex and intricate patterns within single-cell genomics. This integration is crucial for advancing the field of personalized medicine.

Well from my perspective, it is the future, the exact tech that could transform modern medicine. I would definitely work on that.

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3 If you joined Liu’s lab, what project would you do

Transcriptomics…. extend that into single cell transcriptomics… (就说single-cell transc…. 的优点呗） to understand … cardiovascular diseases such as diabetes. As long as it’s related to Liu’s group.

If I were to join Professor Liu's lab, my proposed project would focus on applying single-cell transcriptomics, combined with AI and ML technologies, to study cardiovascular diseases. Leveraging my background in transcriptomics, I aim to explore the intricate cellular diversity and molecular dynamics at play in cardiovascular conditions. The integration of AI and ML will enhance our ability to analyze and interpret the complex data obtained from single-cell studies, providing deeper insights into the cellular processes and potential therapeutic targets for these diseases.

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4 Background in medicine, statistics, and computer science, warrant to take some pharmacy courses....

You can just Tell them that You have talked to me that I only have to take 2 pharmacy courses. (you have to take 7 classes and only 2 should be related to pharmacy. For other courses you may choose statistics, computer science....)

Prof. Liu told me that I have to only take 2 pharmacy courses and have the freedom for the other 5 elective classes.

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5 Plan after your PhD

Postdoc position (U.S.?) in the most renowned institution of the world in my area, to continue my research.

After postdoc, tenure in some university ?

Also, I enjoy problem-driven research so I would be also happy working in a hospital or bio-company.

"After completing my PhD, I plan to pursue a postdoctoral position in the most renowned institution in my field (maybe in America or somewhere) . This will allow me to further my research.

Following my postdoc, I would consider a tenure-track position at a university.

Additionally, I have a passion for problem-driven research, I am open to opportunities in hospitals or biotech companies.

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6 Why you spend 6-year for your undergraduate program

Driven by my interest for computational methods in biology and medicine. From my wet lab, I discovered the power of bioinformatics. And on my bioinformatic research, I found that my research was greatly limited. The general one-fits-all bioinformatic analysis workflow sometimes failed to explore the complicated RNA-seq for our specific cardiovascular diseases. I know if I want to go further for my research, I have to be equipped with the ability to understand more about the tools and even develop new tools.

That’s why later I decided to prolong my undergraduate study and pursued a double degree in statistics at ZJU, to lay a good foundation of math and programming.

Well It's quite uncommon for Chinese students. But for me, my passion is driven by my intention to do good research in an interdisciplinary area such as bioinformatics and genomics.

~~I don't worry about the competitions. I don't feel bad just because I'm older than my classmates...~~ Rather, I think for humans, what really matters for us is to choose exactly the thing that we have passion for, although sometimes it may take us long years to lay a good foundation for it. I think it's worth of it.

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7 one thing you'd like to do outside the research

- Boxing. Be a boxer. Be very strong. To do that, I go to the gym almost every day.
- Visit the Johns Hopkins Hospital, the most renowned hospital and learn more about their healthcare system / to observe their healthcare system.
    - Johns Hopkins Hospital
    - ~~Massachusetts General Hospital~~
    - ~~Mayo Clinic~~
- Provence, Lavender field??

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8 Scholarship?

If they don't ask, you don't have to talk about this. If they ask about your funding, say:

I Have applied to the NUS Research Scholarship. I have also talked to Prof. Liu, and told me that his lab has also funding.

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9 Other competitive offers?
