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PMX group

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Dear PMX group,

I am a Ph.D. candidate at MIT writing to apply for the Novartis Quantitative Sciences Academia to Industry Hackathon. I am particularly inspired by the program's goal to bridge the gap between academia and industry, and the opportunity to collaborate with like-minded scholars, practitioners from around the world.

In 2012, I began my Ph.D. at MIT as I aspired to make progress in developing HIV vaccine. Over the last five years, I have collaborated with immunologists, chemists, and engineers to develop a mathematical model of antibody evolution that predicts key features of the immune response. In addition to applying regression techniques to estimate a model parameter, I implemented an advanced tau-leap gillespie simulation that runs 50 times faster than common stochastic simulation with less than 2% error trade-off. The model simulation has led to elucidate a novel mechanism that underlying 20 times more effective antibody response induced by the temporal vaccine protocol than the conventional prime-boost vaccination. In conjunction with this work, I published two joint first author articles in top peer-reviewed journals.

To broaden my perspective on tackling HIV/AIDs epidemics, I sought a competitive internship at HIV, Health and Development Group at the United Nations Development Programme (UNDP). At UNDP, I developed analytics for projects implementing human rights-based legal responses to HIV. For instance, in one of the projects, I performed incremental burden analysis of HIV, HCV and TB if new treatments - Dolutegavir, Sofosbuvir, Delaminid respectively - are procured at inequitable pricing and licensing terms in low and middle-income countries. Based on this study, our team submitted a grant proposal to Unitaid for a project consulting and strategizing appropriate legal and policy measures to ameliorate access to treatment gap in these countries.

While working as a technical consultant for two companies through the MIT practice school program, I received commendations for my communication skills from both the host company and my supervisors from MIT, in addition to achieving deliverables for four product development projects. The practice school experience also trained me to thrive in professional collaboration settings: I worked with inventors of technology, and communicated with CTOs on technical and business-related matters while leading a project.

In various roles at MIT, multilateral, and non-profit organization, I've been exposed to scientific and political context around global crisis like HIV. Motivated by these experiences, I plan to pursue a career in doing research for neglected diseases and designing policy for access to medicines upon completion of my Ph.D. The Novartis Hackathon will complement my training in science and policy with technical and management skills from a clinical perspective. At the Novartis Hackathon, I aspire to leverage my current skills and learn more from colleagues with frameworks and skills to address the critical gap in translational research.

Sincerely,

Myungsun Kang