



Parliamentary and Scientific Committee



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Changing How We See Life

Artificial Intelligence (AI) has progressed at an unprecedented pace in recent years. These developments have resulted in exciting opportunities to improve our understanding and treatment of various diseases, and this what our three expert speakers spoke about this evening. Professor James Naismith from The Rosalind Franklin Institute and Professor Sheena Radford from the University of Leeds spoke to us about how AI is helping us understand disease at a molecular level, potentially creating a powerful new way of treating many diseases. Dr Michalis Papadakis, Co-Founder & CEO of Brainomix, spoke to us about his company was using AI to streamline treatment for strokes, improving the outcomes for patients. The Q&A session largely focused on how we can make sure this new technology has the ability to develop safely, and be implemented in the healthcare system in the most efficient way.

Research at the molecular level allows us to understand the fundamentals of our biology, looking at the many mechanism which allow us to live and function. Research into protein structure is a key part of this research, as the function of proteins follows their form. The key to this is figuring out how proteins fold, but this is a tricky task. Prof. Naismith and Prof. Radford explained to us how AlphaFold, an AI powered programme developed by DeepMind, is transforming this field. In its development, the programme was given the many decades of research into protein folding and learnt how to predict this folding, enabling it to understand this process for many more proteins: for some perspective, scientists were able to solve the protein folding problem for 250,000 proteins over 40 years, whereas AlphaFold was able to do this for 200 million protein within a few hours.

Understanding the folding process allows us to understand where and how this process goes wrong, which is the fundamental mechanism to

many chronic diseases we can develop as we age. An understanding of this allows for the development of better, more targeted treatments. Furthermore, due to the enhanced puzzle-solving ability thanks to AlphaFold's development, scientists are also able to look at theoretical proteins —structures which aren't found naturally within our bodies. This could help with the development of new drugs to protect us against viruses and other pathogens, further demonstrating the potential of this new technology.

AI is helping with diagnostics as well as treatment development. Timing is key when treating strokes, and Dr Papadakis explained to us how Brainomix is helping to diagnose stroke patients in record time. The programmes reviews the scans of patients brains, and can send the information to physicians within minutes. Given that most stroke patients start on a primary stroke ward and are transferred to a comprehensive stroke ward after a review of their scans. The programme allows for this transfer much faster, resulting in better treatment for individuals. A case study for this success is Reading Hospital, who saw their door-in-door-out time drop from 140 mins to 79 mins, and the proportion of patients achieving independence increase from 16% to 48%. The programme has been used in 37 hospitals and 5 NHS stroke networks, with results from this trial being realised within the next few months.

AI is a powerful technology, and one that has the potential to transform our lives in many ways. This evening was an excellent example of the huge opportunities that comes with this technology, and how it could our health in the years to come.

Alfie Hoar

P&SC Discussion Meeting, 'Changing how we see life'

16th October 2023