UNIVERSITY OF CAMBRIDGE
Department of Clinical Neurosciences

**Stefano Pluchino, MD, PhD**
Professor of Regenerative Neuroimmunology
& Honorary Consultant in Neurology

18th February 2025
Cambridge, UK

**Letter of Recommendation for Pranathi Prasad**
**Hong Kong Laureate Forum 2025**

Dear Selection Committee,

It gives me extreme pleasure to write in support of **Pranathi Prasad**'s application for the **2025 Hong Kong Laureate Forum**.

Successful scientists today must not only be subject matter experts but also strong leaders who can develop and manage their research for maximum impact. Pranathi embodies this combination and unique ability, which has already led to groundbreaking results published in prestigious journals (such as ***Nature*** and ***Cell Stem Cell***), de facto positioning her as a rising star poised to make significant contributions to applied research.

I first met Pranathi while she was finishing her undergraduate studies at Jacobs University Bremen (Germany), where she was awarded a full scholarship for achieving an SAT score in the 99th percentile. Even at that early stage in her career, it was evident to me that she was an exceptionally intelligent and motivated student. During her undergraduate, Pranathi developed her research skills by undertaking placements at leading institutions across Europe, including the San Raffaele Scientific Institute (Milan), the International Centre for Genetic Engineering and Biotechnology (Trieste) and Charité's Institute of Microbiology, Infectious Diseases and Immunology (Berlin), where she was trained by award-winning scientists - including Dr Christoph Klose, a recipient of the Robert Koch young investigator prize. In parallel, Pranathi had already started developing her leadership skills as a young scientist, designing an innovative problem-based learning approach to teach biochemistry, for which she was awarded €50,000 to pilot the course. Pranathi graduated in the top 1% of her class, on the Director's Honour Roll, and with an undergraduate thesis contributing to a publication in ***Protein Science*** **(2022)**. Her commitment to academic research at the highest levels coupled with her drive and leadership skills made it clear to me that she would be an excellent addition to my lab. As a result, I enthusiastically supported her application for a PhD, which she began in October 2021 as one of the youngest PhD students I have had, and as a recipient of the prestigious Medical Research Council Doctoral Training Partnership (MRC-DTP) studentship and Cambridge Trust International Scholarship.

Pranathi's research in my lab focuses on addressing a significant unmet clinical need in **Multiple Sclerosis (MS)**, the most common inflammatory disorder of the central nervous system, with almost 3 million people affected worldwide. Pranathi is focusing on finding new treatment options for those patients suffering from Progressive Multiple Sclerosis (P-MS), which leads to an unrelenting accumulation of neurological disability that is driven by inflammation in the brain and spinal cord. However, the exact molecular mechanisms responsible for this inflammation have yet to be elucidated. Pranathi has uncovered a novel potential source for this inflammation:

mitochondria-derived double-stranded RNA fragments. By studying patient-derived cells, Pranathi's research has shown that the accumulation of such fragments within cells of the brain is interpreted as a signal for viral or bacterial infection, triggering cell intrinsic inflammatory and spreading premature-aging mechanisms in neighbouring cells. Crucially, Pranathi has shown that by using gene knock-down technology, she can prevent the sensing of these fragments, effectively halting the spread of cellular dysfunction. Pranathi's findings reveal RNA fragments as critical source for inflammation in P-MS, potentially reshaping our understanding of mechanisms of disease progression. **By doing so, Pranath has identified a unique, novel, and promising mechanism to prevent the spread of neuroinflammation in MS**. Strikingly, her findings coincide with similar results recently announced by research groups studying brain ageing as well as a range of neurological disorders, including Alzheimer's and ALS. This suggests that the mechanisms driving inflammation across these conditions may be more similar that previously thought, and that targeting the sensing of the double-stranded RNA fragments may be a highly innovative approach for the treatment of neuroinflammation in several neurodegenerative disorders. These finding are now part of a scientific article Pranathi is in the process of submitting for publication as first author.

In her leadership of this project, Pranathi has showcased herself as a highly collaborative and effective scientist, bringing together collaborators from over six separate research groups across five different countries. By presenting her work at several international scientific conferences, Pranathi garnered enthusiastic feedback from the research community, sparking such research collaborations. Pranathi's research output has also resulted in her co-authorships in the lab's recent publications in ***Nature*** **(2024)** and ***Cell Stem Cell*** **(2024)**, another publication in revision at ***Neuron*** as well as a first-author book chapter in the ***Encyclopaedia of Cell Biology, 2nd Edition*** **(2023)** and insight article in the ***Journal of Experimental Medicine*** **(2023)**. Her work has also contributed to successful grant applications (Italian MS Foundation, FISM 2022) and generated novel lines of investigation for incoming PhD students.

Pranathi's accomplishments beyond the lab bench are perhaps even more apt in demonstrating her dedication to the application of science to the benefit of people and communities. Firstly, Pranathi completed a policy placement within the UK government with funding support from the MRC-DTP. Here, she utilised expert insights from academia to advise the Department of Education on (1) addressing the acute shortage of social workers across the UK and (2) designing a framework for the safe use of generative AI in schools. Thanks to these experiences, she was selected by Cambridge's Centre for Science and Policy (CSAP) to design and lead a 3-month study which identified key factors determining early career researchers' willingness to engage with policy. Secondly, Pranathi has also explored how new scientific advances can produce technologies with the potential to improve people's lives. Indeed, her project with Cambridge's EnterpriseTech program involved advising an early-stage biotech start-up with potential applications in autoimmune diseases including MS. This experience led her to being selected as fellow on Cambridge Gravity's Bio-Spark program, where she is currently working with AstraZeneca Oncology to forecast key advances in antibody-drug conjugate (ADC) technology. Lastly, Pranathi's commitment to science and its public benefit is demonstrated by her volunteer work with charities including Sense about Science, as well as her fundraising and participation in the upcoming 2025 Cambridge Half Marathon in support of Alzheimer's Research UK.

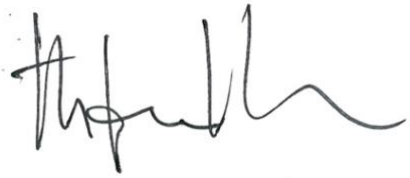
Together, these experiences have shaped Pranathi into a highly successful scientist, with a track record of excellence in the realm of academic research, as well as its applications into policymaking and biotechnology. I am certain that Pranathi has and will continue to make significant contributions to applied research and can confidently say that she ranks among the top 1% of students I have ever supervised.

As such, I whole-heartedly recommend Pranathi Prasad for the **2025 Hong Kong Laureate Forum**.

Please do not hesitate to contact me for any further information.

With my best wishes,

Stefano Pluchino



**Key References**


1. **P Prasad**, A Dugourd, AM Nicaise, CM Willis, M Miclaus, L Barea Moya, D Maddison, RB Ionescu, S Gil-Perotin, S Khoronenkova, JM Garcia Verdugo, E Avezov, A Von Kriegsheim, J Saez-Rodriguez, M Tigano, G Balmus and S Pluchino. 'Cytosolic mitochondrial RNA drives senescence and innate immunity in a patient stem cell model of progressive Multiple Sclerosis'. *Manuscript in preparation*
2. B Park, AM Nicaise, D Tsitsipatis, L Pirvan, **P Prasad**, M Larraz Lopez De Novales, J Whitten, L Culig, J Llewellyn, RB Ionescu, CM Willis, G Krzak, J Fan, S De, M Suarez Cubero, A Spathopoulou, L Peruzzotti-Jametti, T Leonardi, F Edenhofer, M Gorospe, I Mohorianu, S Pluchino and I Beerman. 'Integrative single-cell analysis of neural stem/progenitor cells reveals epigenetically dysregulated interferon response in progressive multiple sclerosis.' ***NEURON***, *under review* (IF: 16.268)
3. RB Ionescu, AM Nicaise, JA Reisz, EC Williams, **P Prasad**, M Dzieciatkowska, D Stephenson, M Suarez Cubero, L Pirvan, CM Willis, L Peruzzotti-Jametti, V Fossati, F Edenhofer, T Leonardi, C Frezza, I Mohorianu, A D'Alessandro and S Pluchino. 'Increased Cholesterol Synthesis Drives Neurotoxicity in Patient Stem Cell-Derived Model of Multiple Sclerosis.' ***CELL STEM CELL*** 2024; 31: 1-17 (IF: 24.668)
4. L Peruzzotti-Jametti, CM Willis, G Krzak, R Hamel, L Pirvan, RB Ionescu, JA Reisz, HA Prag, ME Garcia-Segura, V Wu, Y Xiang, B Barlas, AM Casey, AMR van den Bosch, AM Nicaise, L Roth, GR Bates, H Huang, **P Prasad**, AE Vincent, C Frezza, C Viscomi, G Balmus, Z Takas, J Marioni, A D'Alessandro, MP Murphy, I Mohorianou and S Pluchino. 'Mitochondrial complex I activity in microglia sustains neuroinflammation.' ***NATURE*** 2024; 628, 195-203 https://doi.org/10.1038/s41586-024-07167-9 (IF: 64.800)
5. S Pluchino and **P Prasad**. 'Oligodendroglia-to-Neuron Material Transfer lights up the Mouse CNS'. ***J EXP MED*** 2023; 220 (7): e20230489 (IF: 17.579)
6. A Saikia, A Hadeler, **P Prasad**, M Zacharias, S Springer. 'Fast peptide exchange on major histocompatibility complex class I molecules by acidic stabilization of a peptide-empty intermediate.' ***PROTEIN SCIENCE*** 2022; 31(12), e4478 (IF: 8.0)