ARAVIND MEDICAL RESEARCH FOUNDATION

To whom it may concern 21.08.2023

I am very happy to write this reference letter to **Ms. ISWARYA R** who is working as a Senior Research Fellow under my guidance in the Department of Immunology and Stem Cell Biology, Aravind Medical Research Foundation, Madurai. She is a gold medalist in under graduation and completed her M.Sc. Biotechnology from Lady Doak College, Madurai with special distinction. She cleared GATE BT February 2018, CSIR NET Lectureship in November 2018 and CSIR NET JRF in December 2019.

She joined our laboratory in June 2018 as a Project Assistant to work on a SERB project entitled 'Characterization and functional evaluation of trabecular meshwork stem cells in a glaucomatous model" which she successfully completed. Further, she completed a Sun Pharma project entitled 'Role of trabecular meshwork stem cell-derived extracellular vesicles in human trabecular meshwork regeneration' which is a part of her Ph.D work. She learned tissue culture, sectioning, immunostaining, confocal microscopy, ultracentrifugation, nanoparticle tracking analysis, SDS-PAGE, western blotting and mass spectrometry. She has demonstrated that the transplantation of cultured human trabecular meshwork stem cell (TMSC) in human organ culture of anterior segment model results in homing of the transplanted cells to TM and reduction in intraocular pressure, highlighting the need for stem cell-based therapy for glaucoma. With the demonstration of mesenchymal stem cell (MSC) derived exosomes as equivalent to cultured MSCs by others, Ms. Iswarya started her Ph.D. work to evaluate the efficacy of TM stem cell-derived exosomes as an alternative for cell-based therapy for glaucoma.

She has demonstrated that TMSC exosomes to have enhanced wound healing and anti-oxidant potential *in vitro*. Proteomic analysis also confirmed the up regulation of corresponding proteins in TMSC exosomes compared to TM exosomes. Thus she has now established "a proof of concept" for developing a TMSC exosome based therapy for patients with primary open angle glaucoma.

Ms. Iswarya is a hard worker, a quick learner, and a good team player. Based on her work, she has submitted a book chapter on "Isolation and Characterization of Trabecular Meshwork Stem Cell Exosomes from the Conditioned Medium". She has also received national and international recognition for the above work: the Zhongmei Chen Yong award and Merit abstract award from the International Society for Stem Cell Research (ISSCR) for her poster presentation in 2021, travel award from the Indian Eye Research Group meeting in 2022 to present her work, 2nd prize for the poster presentation in Research Council Meeting 2022 and first price in Research Council Meeting 2023.

Primary open angle glaucoma is a leading cause of irreversible blindness worldwide and there are about 12 million people in India affected with glaucoma, accounting for 12.8% of blindness in our country. Current therapy for glaucoma is focused on reducing intraocular pressure by life-long use of drugs to reduce aqueous humor production or by increasing the outflow by surgical intervention as an alternative to the above, Ms. Iswarya's findings will enable the establishment of a nanovesicles based therapy for treating patients with glaucoma. Hence, I hereby nominate and strongly recommend her application for the Sun Pharma Science Scholar Award 2023.

Signature of the Nominator

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