

**VISION RESEARCH FOUNDATION**  
NEW NO.41 (OLD NO.18), COLLEGE ROAD, CHENNAI – 600 006



**ANNUAL REPORT & AUDITED ACCOUNTS**  
**2020 – 21**



## VISION RESEARCH FOUNDATION

Date : 03 September 2021

The Members of the Vision Research Foundation

### **NOTICE**

NOTICE IS HEREBY GIVEN TO THE MEMBERS OF VISION RESEARCH FOUNDATION THAT THE 37<sup>TH</sup> ANNUAL GENERAL MEETING OF VISION RESEARCH FOUNDATION WILL BE HELD ON SATURDAY, THE 25<sup>TH</sup> SEPTEMBER 2021 AT 12.00 NOON. THE AGENDA FOR THE MEETING IS GIVEN BELOW. THE MEETING WILL BE HELD ONLINE DUE TO THE PREVAILING COVID PANDEMIC.

### **AGENDA**

1. To consider and adopt the Annual Report of the Hon. Secretary for the year 2020-21.
2. To consider and adopt the Audited Income and Expenditure Account for the year ended March 31, 2021 and the Balance Sheet as at that date together with the Report of the Auditors thereon.
3. To appoint statutory auditors for the financial year 2021-22 and to fix their remuneration.
4. To appoint the following Members to the Board of Management in the vacancies caused by their retirement, who are eligible for re-appointment:

<b>Name</b>	<b>Category of Membership</b>
Dr. Ronnie Jacob George	Honorary Member
Shri. Homi C H Bhabha	Donor Member

Kindly make it convenient to attend the meeting.

**DR S BHASKARAN  
HON. SECRETARY**

Note:

Explanatory statement for Item 4 of the Agenda is attached.



## VISION RESEARCH FOUNDATION

### **Explanatory Statement**

Refer Item No 4 of the Agenda

Dr. Ronnie Jacob George was appointed to the Board of Management for a period of three years at the Extra-ordinary General Meeting held on 24<sup>th</sup> August 2018 and Shri. Homi C H Bhabha at the 34<sup>th</sup> Annual General Meeting held on 24<sup>th</sup> September 2018.

Their term of appointment expires at the end of the Annual General Meeting on 25<sup>th</sup> September 2021. As per 16(xiv) of the Bye-laws of the Foundation read with Section 15 (5) of the Tamil Nadu Societies Registration Act 1975, they are eligible for reappointment to the Board of Management.



# VISION RESEARCH FOUNDATION

## **BOARD OF MANAGEMENT**

Dr Ronnie Jacob George  
Dr S Bhaskaran

President  
Honorary Secretary

### **Members of the Board**

Dr J Biswas	Member
Mr Homi C H Bhabha	Member
Dr H N Madhavan	Member
Mr R Rajagopal	Member
Dr T S Surendran	Member
Dr S Suresh	Member
Mr V Vaidyanathan	Member
Dr L Vijaya	Member

Director – Research  
Deputy Director – Research  
Manager

Dr. Ronnie Jacob George  
Dr. S Krishnakumar  
Mr. S Narayan

Auditors

M/s S Viswanathan LLP  
Chartered Accountants, Chennai

Bankers

HDFC Bank, Chennai – 600 034  
Indian Overseas Bank, Chennai – 600 006  
State Bank of India, Chennai –600 034  
State Bank of India, New Delhi.

Registered Office

New No.41, Old No.18, College Road  
Chennai – 600 006



## VISION RESEARCH FOUNDATION

### **INSTITUTIONAL REVIEW BOARD (ETHICS COMMITTEE) MEMBERS**

Prof. H N Madhavan  
Dr. Bakulesh M. Khamar  
Dr. Manjula Dutta  
Dr. Ronnie Jacob George  
Dr. S Krishnakumar  
Dr. T S Surendran  
Prof. N Vizheenathan  
Mrs. Radhika Krishnan  
Lion G V Raman  
Dr. Rama Shankar Verma  
Mrs. Sujatha Viswanath  
Mrs. Nalini Ravindran

### **RESEARCH SUB-COMMITTEE MEMBERS**

Dr. Ronnie Jacob George  
Dr. J. Biswas  
Dr. S Krishnakumar  
Prof. H N Madhavan  
Dr. Rama Shankar Verma

### **RESEARCH CELL COMMITTEE MEMBERS**

Dr. Ronnie Jacob George  
Dr. H N Madhavan  
Dr. L Vijaya  
Dr. S Krishnakumar  
Dr. Sumita Agarkar  
Dr. J Biswas  
Dr. R R Sudhir  
Dr. Vikas Khetan  
Dr. Prema Padmanabhan  
Dr. N Angayarkanni



## VISION RESEARCH FOUNDATION

### **INSTITUTIONAL COMMITTEE FOR STEM CELL RESEARCH**

Prof. Dr. Rama Shankar Verma  
Dr. H.N. Madhavan  
Mrs. Radhika Krishnan  
Dr. S Arumugam  
Prof. N. Veezhinathan  
Dr. Ronnie Jacob George  
Dr. Rama Rajaram  
Dr. Rosy Vennila  
Dr. Bakulesh M Khamar

### **INSTITUTIONAL BIOLOGICAL SAFETY COMMITTEE**

Dr. H.N. Madhavan  
Dr. M Natarajan  
Mr. S Narayan  
Dr. S Krishnakumar



## VISION RESEARCH FOUNDATION

### ANNUAL REPORT FOR THE YEAR 2020-21

#### Report of the Honorary Secretary to the Members of the Foundation

It gives me great pleasure to welcome you all to this 37<sup>th</sup> Annual General Meeting of our Foundation. I am pleased to present the Thirty Seventh Annual Report of Vision Research Foundation. The thirty sixth Annual General Meeting of the Foundation was held on 30<sup>th</sup> December 2020 in which the Annual Report and the Audited Accounts of the Foundation for the financial year ended 31<sup>st</sup> March 2020 were approved by the members and M/s. S Viswanathan LLP, Chartered Accountants, were re-appointed as Auditors for the financial year 2020-21.

The donations received during the year under report were Rs.147.07 lakhs as compared to Rs. 184.37 lakhs in the previous year. The gross total income for the year under review was Rs.570.00 lakhs including research grants and interest on deposits. The total expenditure before providing depreciation was Rs.743.30 lakhs resulting in a cash deficit of Rs.173.30 lakhs. After considering depreciation for the year and loss on discarded assets, there was a net deficit of Rs.291.26 lakhs, which was carried over to the capital fund account. The non-recurring grant of Rs.12.40 lakhs received from Government Funding Agencies was accounted under capital fund account.

Summary of Source and applications are as follows:

<b>Sources</b>	<b>Rs. in Lakhs</b>
1. Grant for Equipment	11.87
2. Decrease in Net Current Assets	222.53
3. Increase in Non-current Liabilities	9.31
	<hr/> <b>243.71</b> <hr/>
 <b>Applications of Funds</b>	
1. Increase in Fixed Assets	7.72
2. Decrease in Net Current Liabilities	62.69
3. Cash Deficit	173.30
	<hr/> <b>243.71</b> <hr/>



## VISION RESEARCH FOUNDATION

The foundation has received a sum of Rs.358.21 lakhs as research grants, during the year under review as per the details given below :

	<b>Rs. in Lakhs</b>	
<b>Research Grants – Basic Science</b>	<b>2020-21</b>	<b>2019-20</b>
1. Council of Science & Industrial Research	4.86	12.42
2. Indian Council of Medical Research	86.48	103.58
3. Department of Biotechnology	67.02	247.10
4. Department of Science & Technology	14.89	38.76
5. Fellowship Programme	106.31	98.02
6. NHS Foundational Trust	48.28	58.67
7. Indian Institute of Technology	0.71	3.07
8. Medgenome Labs Ltd	3.49	.00
9. The Glaucoma Foundation	6.51	22.42
10. Others [incl. Conference Receipts]	7.26	34.77
<b>Total</b>	<b>345.81</b>	<b>618.81</b>
<b>Clinical Science</b>		
11. Excel Life Sciences Pvt. Ltd.	1.26	3.15
12. Microsoft India (R & D) Pvt Ltd.	4.47	7.16
13. Parexel Intl. Clinical Research Pvt Ltd	0.04	12.30
14. Others	6.63	7.25
<b>Total</b>	<b>12.40</b>	<b>29.86</b>
<b>Grand Total</b>	<b>358.21</b>	<b>648.67</b>

### **Research Activities:**

Research activities during the financial year were satisfying. A number of projects were submitted to the Indian Council of Medical Research, Department of Science and Technology and Department of Biotechnology.

The projects which were under consideration by the Govt. agencies as on date are as under:





## VISION RESEARCH FOUNDATION

<b>Title of the Project</b>	<b>Funding Agency</b>	<b>Grant Amount for 2021-22 (Value in Rs.)</b>
A study on the DNA methylation pattern of the ocular quantitative trait loci/genes in primary open angle glaucoma. [Dr. S Sripriya]	Indian Council of Medical Research	20,20,118/-
Does Hyperglycemia Alter Copper Homeostasis in Diabetic Retinopathy [Dr. S R Bharathi Devi]	Department of Biotechnology	11,46,000/-
To delineate the role of Zinc alpha 2 glycoprotein as a novel target in diabetic retinopathy [Dr. S R Bharathi Devi]	Indian Council of Medical Research	11,60,800/-
Artificial Intelligence for Affordable Screening and Prediction of Diabetic Retinopathy in the Framework of Big Data [Dr. Rajiv Raman]	Department of Biotechnology	71,37,420/-

Due to the Covid 19 pandemic situation from end March 2020 to mid-September 2020, meetings of the Board of Management and Institutional Review Board (Ethics Committee)/Research Sub-Committee were conducted virtually/through circulation.

### ***Manpower Details:-***

<u>Manpower</u>	<u>As on 31<sup>st</sup> Mar 2021</u>	<u>As on 31<sup>st</sup> Mar 2020</u>
Deputy Director / Head of the Dept / Chief Scientist / Professor	1	1
Head of the Dept / Chief Scientist / Senior Professor	1	1
Head of the Department / Chief Scientist / Professor	1	2
Manager	1	1
Senior Principal Scientist / Associate Professor	3	3
Principal Scientist / Associate Professor	5	6
Principal Scientist / Assistant Professor	2	2
Senior Scientist II / Assistant Professor	1	1
Senior Research Scientist	1	1



## VISION RESEARCH FOUNDATION

Post Doc. Fellow / Research Associate	5	7
Project Manager / Project Coordinator	1	2
Research Fellows	2	3
Senior Research Fellows	11	16
Junior Research Fellows	10	12
Social Workers / Field Workers	3	4
Research / Project / Technical Asst	6	5
Junior Scientist	2	2
Research Optometrist	4	4
Executives / Staff / Technicians	17	19
Bio-statistician	1	1
Part Time Scientists	49	53
<b>Total</b>	<b>127</b>	<b>150</b>

### **Conclusion:**

I would like to take this opportunity to place on record my gratitude for all the guidance extended to me by Dr. S S Badrinath, Founder Member; Dr. Ronnie Jacob George, President & Director – Research; and Dr. S Krishnakumar, Deputy Director – Research; and all the members of the Board of Management, and members of the sub-committees of Vision Research Foundation.

I would like to mention that the achievements and awards received by the scientists, details of completed projects and ongoing projects, and the articles published in the national and international journals are given separately. Due to the Covid 19, many international/national conferences were held virtually and our scientists participated in the virtual meetings and the details are also given separately.

The eighth Patent Certificate for Vision Research Foundation has been granted to the patentee, Vision Research Foundation by the Patent office Chennai, Government of India for an invention entitled "Inhibition of Angiogenesis" on 13<sup>th</sup> November 2020. The Inventors are Dr. K. N. Sulochana, Dr. S. R. Barathi Devi & Ms. Iyer Gomathy Narayanan, Department of Biochemistry & Cell Biology.

As per the new provisions in the Foreign Contribution (Regulation) Act, 2010 (Amended), a designated FCRA Savings Account in State Bank of India, New Delhi Main Branch, New Delhi, has been opened on 25<sup>th</sup> March 2021.



## VISION RESEARCH FOUNDATION

My thanks are also due to the Auditors, M/s. S Viswanathan LLP particularly to their partners, Mr. Chella K Srinivasan and Mr. R M Narayanan for their active and invaluable support and our Bankers, HDFC Bank Ltd, Indian Overseas Bank and State Bank of India for their support and co-operation.

I also thank the Internal Auditors, M/s. Sundar, Ranganath & Srinivasan, Chartered Accountants, for their active support in conducting internal audit of the Foundation.

Mr. S Narayan, Manager, played an active role in managing the finance and administrative activities of the Foundation. I thank him for his help and assistance.

The Board of Management place on record their appreciation of the invaluable contribution made by the Research Scientists, Consultants, para-medics and other employees to the continued success of the institution.

**Dr S Bhaskaran**  
***Hony. Secretary***  
***Vision Research Foundation***



## VISION RESEARCH FOUNDATION

### **HONOURS & AWARDS**

- ❖ Mr. S. Muthukumaran received the PhD degree for his thesis entitled "Computational design, synthesis and validation of potential inhibitors targeting human Ornithine decarboxylase (ODC) to modulate polyamines in retinoblastoma cells" at SASTRA deemed to be university, Thanjavur on 20<sup>th</sup> July 2020 under the supervision of Dr.V.Umashankar.
- ❖ Ms. Bhavna S Rao received the Ph.D. Degree for her thesis entitled "Fuchs' endothelial corneal dystrophy – genetic analysis using whole genome sequencing, association study and candidate gene screening" at SASTRA deemed to be university, Thanjavur, on 3<sup>rd</sup> August 2020 under the supervision of Dr.N.Soumitra.
- ❖ Ms.Karthikka P received the Ph.D. Degree for her thesis entitled "Functional Characterization of Adiponectin in the Molecular events preceding the onset of Diabetic Retinopathy" at SASTRA deemed to be University, Thanjavur, on 5<sup>th</sup> August 2020 under the supervision of Dr.J.Subbulakshmi.
- ❖ Dr.Amit Chatterjee received the PhD for his thesis entitled "Designing and understanding of cell penetrating peptides uptake using keratocorneal epithelium as a clinical model" on 28<sup>th</sup> September 2020 under the supervision of Dr.J.Narayanan.
- ❖ The eighth Patent Certificate for Vision Research Foundation has been granted to the patentee, Vision Research Foundation by the Patent office Chennai, Government of India for an invention entitled "Inhibition of Angiogenesis" on 13<sup>th</sup> November 2020. The Inventors are Dr. K. N. Sulchona, Dr. S. R. Barathi Devi & Ms. Iyer Gomathy Narayanan, Department of Biochemistry & Cell Biology.
- ❖ Mr. Arun John received the PhD for his thesis entitled "In silico design of peptide and chemical inhibitors targeting carbonic anhydrase IX mediated pH homeostasis in cancer cell and in vitro validation of inhibitory efficacies" at SASTRA deemed to be University, Thanjavur on 21<sup>st</sup> December 2020 under the supervision of Dr.V.Umashankar.
- ❖ Dr. Ravikanth Danda, received the "Prof. S. Krishnamoorthy Endowment Award for the year 2020" for the best outgoing Ph.D. student in the 32nd Graduation Ceremony of Sankara Nethralaya held at Sri V.D.Swami Auditorium on 12<sup>th</sup> January 2021.
- ❖ Ms.Ramya received Swarnalatha Punshi Best Researcher Award in Basic science for the year 2020 for her research paper entitled "RAGE silencing deters CML-AGE induced inflammation and TLR4 expression in endothelial cells" at the 32nd Graduation Ceremony of Sankara Nethralaya held at Sri V.D.Swami Auditorium on 12<sup>th</sup> January 2021.
- ❖ Mr.R.N.Naresh Kumar received the Ph.D. for his thesis entitled "Molecular Mechanism of the anti- angiogenic and anti-tumorigenic potential of Lysyl oxidase propeptide" at SASTRA deemed to be University, Thanjavur on 24<sup>th</sup> March 2021 under the supervision of Dr.K.Coral Miriam.



## VISION RESEARCH FOUNDATION

### **Individual Fellowship Awards**

- ❖ Dr. M.Vimalin Jeyalatha was awarded Research Associate fellowship for the project entitled, "Development of a novel serological 'point -of - care device' to detect AQP-4 antibodies for the differential laboratory diagnosis of neuromylitisoptica (NMO)" by Indian Council of Medical Research.
- ❖ Ms. Lakshmi B was awarded Senior Research fellowship for the project entitled, "Downstream functional analysis and validation of single nucleotide polymorphism associated with Triamcinolone-acetonide and Dexamethasone-induced ocular hypertension among Indian subjects" by Indian Council of Medical Research.
- ❖ Ms. Sruthi Priya was awarded Senior Research fellowship for the project entitled, "Delineating the importance of Neddylation, an ubiquitin-like molecule in maintenance of blood retinal barrier integrity and its function" by Indian Council of Medical Research.



## VISION RESEARCH FOUNDATION

### RESEARCH PUBLICATIONS

#### **International Journals:**

- ❖ Ramya Ravi, Nareshkumar Ragavachetty Nagaraj, Bharathi Devi Subramaniam Rajesh. "Effect of advanced glycation end product on paraoxonase 2 expression: Its impact on endoplasmic reticulum stress and inflammation in HUVECs". Life Science, Apr 1 2020.
- ❖ Aishwarya Murali, Subramanian Krishnakumar, Anuradha Subramanian, Sowmya Parameswaran. "Bruch's membrane pathology: A mechanistic perspective" Eur J Ophthalmol, April 28, 2020.
- ❖ Sivaprasad S, Raman R, Conroy D, Mohan 5th, Wittenberg R, Rajalakshmi R, Majeed A, Krishnakumar S, Prevost T, Parameswaran S, Turowski P, Maheswari U, Khobragade R, Netuveli G, Sadanandan R, Greenwood J, Ramasamy K, Rao M, Bergeles C, Das. "The ORNATE India Project: United Kingdom- India Research Collaboration to tackle visual impairment due to diabetic retinopathy" Eye (Lond) 34, 1279-1286 (2020), 12<sup>th</sup> May 2020.
- ❖ Vimalin Jeyalatha Mani, Durgadevi Parthasarathy, Prema Padmanabhan, Niveditha Narayanan, Meena Lakshmipathy, Pachayappan SK, Jayavel P, K Lily Therese, HN Madhavan, Malathi Jambulingam. "Therapeutic Effect of Corneal Crosslinking on Fungal Keratitis: Efficacy of Corneal Collagen Crosslinking as an Adjuvant Therapy for Fungal Keratitis in a Tertiary Eye Hospital in South India". Ocul Immunol Inflamm. 2020 May 13.
- ❖ Amit Chatterjee, Hemavathy Nagarajan, Prema Padmanabhan, Umashankar Vetrivel, Kulandhai Lily Therese, and Narayanan Janakiraman. "Understanding the Uptake Mechanism and Interaction Potential of the Designed Peptide and Preparation of Composite Fiber Matrix for Fungal Keratitis". ACS Omega. 2020 May 21, 12090-12102.
- ❖ Ramalingam Mani, P. S. Shobha, Saravanan Thilagavathi, Padmanabhan Prema, Natarajan Viswanathan, Ratra Vineet, Ratra Dhanashree, Narayanasamy Angayarkanni I\*D. "Altered mucins and aquaporins indicate dry eye outcome in patients undergoing Vitreoretinal surgery", PLOS ONE May 21, 2020.
- ❖ M Aloysius Dhivya, S Aberami, S Nikhala Shree, J Biswas, Wenjie Liu, Joseph Irudayaraj, K N Sulochana, Coral Karunakaran, S R Bharathi Devi. "Copper mediates mitochondrial biogenesis in Retinal pigment epithelial cells". BBA-Molecular Basis of Disease (ELS), May 23, 2020.
- ❖ Dhanashree Ratra, Rajesh Nagarajan, Daleena Dalan, Nandini Prakash, Kaviarasan Kuppan, Sadagopan Thanikachalam, Undurti Das, Angayarkanni Narayansamy. "Early structural and functional neurovascular changes in the retina in the prediabetic stage". Eye (Lond), May 28, 2020.
- ❖ Rajeswari Raguraman, Sowmya Parameswaran, Jagat Rakesh Kanwar, Madavan Vasudevan, Srujana Chitipothu, Rupinder Kaur Kanwar, Subramanian Krishnakumar. "Gene expression profiling of tumor stroma interactions in retinoblastoma" Experimental Eye Research. 2020 Jun 22.



## VISION RESEARCH FOUNDATION

- ❖ Bhuvaneswari Ganesan, Sowmya Parameswaran, Ashwani Sharma, Subramanian Krishnakumar. "*Clinical relevance of B7H3 expression in retinoblastoma*" Nature Research Scientific Reports, June 2020.
- ❖ Shweta Agarwal, Bhaskar Srinivasan, Narayanan Janakiraman, Lily K. Therese, Krishnakumar S, Nilay Patel, Thenmozhi V and Geetha Iyer. "*Role of topical ethanol in the treatment of Pythium insidiosum keratitis - A Proof of Concept*" Cornea. 2020 Sep 1; 39(9):1102-7 , 11 June 2020.
- ❖ Lily Therese Kulandai, Dhanurekha Lakshmiopathy, and Janaki Sargunam. "*Novel Duplex Polymerase Chain Reaction for the Rapid Detection of Pythium insidiosum Directly from Corneal Specimens of Patients with Ocular Pythiosis*". Cornea 2020 Jun; 39(6):775-778.
- ❖ Muthukumar, S, Sulochana, K. N, & Umashankar, V. "*Structure based design of inhibitory peptides targeting ornithine decarboxylase dimeric interface and in vitro validation in human retinoblastoma Y79 cells*". Journal of Biomolecular Structure and Dynamics, 1-15, 22 June 2020.
- ❖ Agarwal M, Patnaik G, Sanghvi K, Anand AR, Janani MK, Biswas J. "*Clinicopathological, Microbiological and Polymerase Chain Reaction Study in a Case of Nocardia Scleritis*" Ocul Immunol Inflamm. 2020 Jul 7, 1-5.
- ❖ Jonnalagadda, B., Arockiasamy, S., Vetrivel, U. "*In silico docking of phytocompounds to identify potent inhibitors of signaling pathways involved in prostate cancer*". Journal of Biomolecular Structure and Dynamics, 1-27, 19 July 2020
- ❖ Nagarajan, H., Lakshmi, P. D., & Vetrivel, U. "*Deciphering potential inhibitors targeting THI4 of Fusarium solani sp. to combat fungal keratitis: An integrative computational approach*". Computational Biology and Chemistry, 88, 107350, 2 Aug 2020.
- ❖ Lakshmi Badrinarayanan, Srujana Chitipothu, Sharada Ramasubramanyan, Sarangapani Sripriya, Pukhraj Rishi, Ekta Rishi, Ronnie George, Baddireddi Subhadra Lakshmi, and Sailaja V. Elchuri, "*Assessment of single nucleotide polymorphisms associated with steroid-induced ocular hypertension*" Int J Ophthalmol 2020; 13(8): 1294-1305. Aug 18, 2020.
- ❖ Hemanth Ravishankar, Abubakar Siddiq Mangani, Grace Lydia Phoebe Moses, Sathya Priyadarshini Mani, Sowmya Parameswaran, Vikas Khetan, Suganeswari Ganesan, Subramanian Krishnakumar. "*Serum exosomal miRNA as biomarkers for Retinoblastoma*" Experimental Eye Research. August 11, 2020.
- ❖ Parveen Sen, Puja Maitra, Srikrupa Natarajan, Srivatsan Sripriya, Sinnakaruppan Mathavan, Muna Bhende & Pradeep T Manchegowda. "*CERKL mutation causing retinitis pigmentosa (RP) in Indian population – a genotype and phenotype correlation study*". Ophthalmic Genetics, 31 Aug 2020.
- ❖ Alam MS, Chandran VA, Krishnakumar S "*Primary apocrine adenocarcinoma of the lacrimal sac: an extremely rare variant of lacrimal sac neoplasm*" Orbit. 2020 September 23:1-4.



## VISION RESEARCH FOUNDATION

- ❖ Srilekha Sundaramurthy, Ambika SelvaKumar, Jared Ching, Vidhya Dharani, Sripriya Sarangapani, Patrick Yu-Wai-Man. "*Leber Hereditary Optic Neuropathy – New Insights and Old Challenges*". Graefes Archive for Clinical and Experimental Ophthalmology, 23 Oct 2020.
- ❖ Amit, C, Padmanabhan, P. & Narayanan, J. "*Deciphering the mechanoresponsive role of  $\beta$ -catenin in keratoconus epithelium*". Scientific Reports 10, 21382 (2020), 19 Oct 2020.
- ❖ Ravishankar H, Mangani AS, Phoebe Moses GL, Mani SP, Parameswaran S, Khetan V, Ganesan S, Krishnakumar S. "*Serum exosomal miRNA as biomarkers for Retinoblastoma*" Experimental Eye Research 2020 Oct.
- ❖ Vijay V, Alam MS, Subramanian N, Krishnakumar S, Biswas J, Mukherjee B. "*Periocular Basal Cell Carcinoma: 20-Years Experience at a Tertiary Eye Care Center of South India*". Oman Journal of Ophthalmology 2020 November 2; 13(3):129-135.
- ❖ Ambily Vincent, Viswanathan Natarajan, Vikas Khetan, Subramanian Krishnakumar, Sowmya Parameswaran. "*Heterozygous retinoblastoma gene mutation compromises in vitro osteogenesis of adipose mesenchymal stem cells - a temporal gene expression study*" Experimental Cell Research. 2020 Nov 1;396(1):112263.
- ❖ Sreenivasan J, Rishi P, Das K, Krishnakumar S, Biswas J. "*Retinal Pigment Epithelium Adenoma and Adenocarcinoma*". Ocular Oncology & Pathology, Dec 2020;7 (2):121-132.
- ❖ Agarwal M, Dhiman R, Subramanian Krishnakumar "*Atypical Case of Bilateral Chandler Syndrome with Recurrent Band Keratopathy*" Cornea. 2020 December 2.
- ❖ Mohana Devi Subramaniam, Mahalaxmi Iyer, Aswathy P. Nair, Dhivya Venkatesan, Sinnakaruppan Mathavan, Nimmisha Eruppakotte, Soumya Kizhakkilach, Manoj kumar Chandran, Ayan Roy, Abilash Valsala Gopalakrishnan, Balachandar Vellingiri. "*Oxidative stress and mitochondrial transfer: A new dimension towards ocular diseases*", Genes & Diseases 5 Dec 2020.
- ❖ Hemavathy Nagarajan, Umashankar Vetrivel. "*Membrane dynamics simulation and virtual screening reveals potential dual natural inhibitors of endothelin receptors for targeting glaucomatous condition*". Life Sciences, 269, 119082, 19 Jan 2021.
- ❖ Deepa PR, Nalini V, Surianarayanan M, Krishnakumar S. "*Towards safer non-volatile tissue fixatives: Evaluation of choline-based ionic liquids for fixing ocular tissues*". Ecotoxicology & Environmental Safety, 2021 Feb 20.
- ❖ Srikrupa N Natarajan, Sarangapani Sripriya, Pavithra Suriyanarayanan, Parveen Sen, Ravi Gupta, and Sinnakaruppan Mathavan. "*Whole exome sequencing identifies two novel ALMS1 mutations in Indian patients with Leber congenital Amaurosis*" Human Genome Variations, 29 March 2021.





## VISION RESEARCH FOUNDATION

- ❖ Chatterjee Amit, Gajanan Sathe, Abinaya Shunmugam, Prasanna Kumar Athyala, Vivek Ghose, Srujana Chitipothu, Narayanan Janakiraman, Ramaprabhu Sundara, and Sailaja V. Elchuri. "*Graphitic Carbon Nitride Causes Widespread Global Molecular Changes in Epithelial and Fibroblast Cells*". ACS omega, 23 Mar 2021.
- ❖ Samdani Ansar & Umashankar Vetrivel. "*Structure-based design of small molecule and peptide inhibitors for selective targeting of ROCK1: an integrative computational approach*" Journal of Biomolecular Structure and Dynamics, 2021 March 10.
- ❖ Narasimhan I, Murali A, Subramanian Krishnakumar, Ramalingam S, Parameswaran S. "*Autosomal dominant retinitis pigmentosa with toxic gain of function: Mechanisms and therapeutics*" European Journal of Ophthalmology. 2021 March 31(2):304-320. Epub 2020 Sep 22
- ❖ Sandeep Bose, Amit Chatterjee, Shantha Kumar Jenifer, Biswajit Mondal, Pillalamarri Srikrishnarka, Debasmita Ghosh, Angshuman Ray Chowdhuri, M. P. Kannan, Sailaja V. Elchuri, Thalappil Pradeep "*Molecular Materials through Microdroplets: Synthesis of Protein- Protected Luminescent Clusters of Noble Metals*" ACS Sustainable Chemistry & Engineering Mar 2021, 9, 12, 4554–4563.

### **National Journals:**

- ❖ Therese KL, Lakshmipathy M, Lakshmipathy D. "*First report of Mortierella wolfii causing fungal keratitis from a tertiary eye hospital in India*", Indian J Ophthalmol. 2020 Sep 23.
- ❖ Mahesh M, Sudharshan S, Khetan V, Janani MK, Krishnakumar S. "*Polymerase chain reaction-proven tuberculous anterior segment mass mimicking juvenile xanthogranuloma in a child*". Indian Journal of Ophthalmology 2020 September;68(9):2033-2035.
- ❖ Sivapriya Sivagurunathan, Lakshmi Dhevi N Selvan , Aafaque Ahmad Khan, Sowmya Parameswaran, Harsha Bhattacharjee, Krishna Gogoi, Harsha Gowda, T. S. Keshava Prasad, Akhilesh Pandey, Ashok Kumar S, Pukhraj Rishi, Ekta Rishi, Dhanashree Ratra, Muna Bhende, Narayanan Janakiraman, Jyotirmay Biswas, Subramanian Krishnakumar. "*Proteomics-based approach for differentiation of age-related macular degeneration sub-types*" Indian J Ophthalmol. 69(3):647-654. 2021 Feb 17;.
- ❖ Ramya Ravi, Karunkaran Coral, Bharathi Devi Subramaniam Rajesh. "*RAGE silencing deters CML-AGE induced inflammation and TLR4 expression in endothelial cells*". Experimental Eye Research 25 Feb 2021

### **ACCEPTED FOR THE PUBLICATION:**

- ❖ M Aloysius Dhivya, K N Sulochana, S R Bharathi Devi. "*Copper modulates long pentraxin 3 expression in retinal pigment epithelial cells*" Cellular Signalling.



## VISION RESEARCH FOUNDATION

- ❖ Ramya Ravi, Anand Kumaraswamy, Preeti Chauhan, Subramaniam Rajesh Bharathidevi. *"Exogenous administration of hydrogen sulphide alleviates homocysteine induced inflammation in ARPE-19 cells"* Experimental Eye Research.
- ❖ Menta Vignesh, Agarwal Shweta , Das S Ujjwalkumar, Lakshmi Moksha, Gurumurthy Srividya , Anandan M Amrutha, Srinivasan Bhaskar, Iyer Geetha, Thirumurthy Velpandian, Narayanasamy Angayarkanni *"Ocular surface sphingolipids associate with the refractory nature of Vernal Keratoconjunctivitis: Newer insights in VKC pathogenesis"*. BJO
- ❖ Manohar Rebecca, Krishnamoorthy Sripriya Shantha B, Lingam Vijaya Bharathselvi M Narayanasamy Angayarkanni *"Increased desmosine in the lens capsules is associated with augmented elastin turnover in pseudoexfoliation syndrome"* British Journal of Ophthalmology.



## VISION RESEARCH FOUNDATION

### COMPLETED PROJECTS

- ❖ Validation of Diabetic retinopathy deep learning algorithm (Microsoft) by using Sankara Nethralaya Diabetic Retinopathy image data set from SNDREAMS [Dr. Rajiv Raman]
- ❖ Effect of the Metabolites Relevant to Pathogenesis of Age Related Macular Degeneration on the Phagocytic Machinery of the Retinal Pigment Epithelial cells and Screening of Therapeutic Molecules: An in vitro study. [Dr. N. Angayarkanni]
- ❖ Cracking the code of NEDD8 conjugation pathway via human antigen R (HuR) in ocular angiogenesis. [Dr. R. Sharada]
- ❖ Evaluating the effect of ocular UV exposure as a major causative factor in a risk model for pseudo-exfoliation syndrome in Indian population. [Dr. A Rashima]
- ❖ Molecular pathogenesis of HIV in T cells and endothelial cells. [Dr. A.R. Anand]
- ❖ Generation of corneal endothelial cells from induced pluripotent stem cells.[Dr. Sowmya Parameswaran]
- ❖ In silico Design and Development of novel peptide inhibitors targeting CD147 through virtual screening and bio-panning of peptide libraries and in vitro validation of anticancer efficacies. [Dr.Krishnakumar]

### INDIVIDUAL FELLOWSHIP:

- ❖ A pilot study to evaluate the expression of tropoelastin intracellularly and its aggregation extracellular to probe the disease mechanism of PXF. [Ms. Rebecca; Mentor: Dr.N.Angayarkanni]
- ❖ Virtual Screening of Natural compounds targeting Human Carbonic anhydrase IX and validation of efficacy as anti-cancer agents through biochemical and in vitro assays. [Mr. Arun John; Mentor: Dr Srujana Chitipothu]
- ❖ Design and Development of automated computational pipelines for intermolecular recognition of kinases pertaining to structure-based drug design and validation [Mr. A.Samdani; Mentor: Dr. Srujana Chitipothu]
- ❖ To delineate the functional role of paraoxonase 2 in regulating angiogenesis. [Ms.Ramya Ravi; Mentor: Dr.S.R.Bharathi Devi]



## VISION RESEARCH FOUNDATION

### **ONGOING PROJECTS**

- ❖ Protocol No. ILJ466-P005, Study Title: Post-Market Clinical Study of the Clareon® AutonoMe™ with Indian Population [Dr Prema Padmanabhan]
- ❖ Development of Cell based systematic evolution of ligands by exponential enrichment (cell-SELEX) for Retinoblastoma. [Dr. S. Krishnakumar]
- ❖ Nuclease resistant aptamer-nanoparticle conjugate against B7-H3 as targeted therapy and imaging in retinoblastoma. [Dr. S. Krishnakumar]
- ❖ Biological Investigation and Degradation Behaviour of Bioglass based artificial cornea material. [Dr. Krishnakumar S]
- ❖ Fluorescent Nanoprobes for Squamous cell carcinoma. A step towards developing a rapid tool for Margin clearance. [Dr. Krishnakumar S]
- ❖ RCUK SIVS1033 : Increasing eye research capacity and capabilities to tackle the burden of blindness in India: a research-based UK-India Collaboration [Dr Rajiv Raman]
  - WP1: SMART INDIA (Statistical Modelling and Risk Assessment of Type 2 diabetes complications in India) study. [Principal Investigator: Dr. Rajiv Raman]
  - WP3: Prospective multicentre discovery and validation of diagnostic circulating biomarkers to detect sight threatening diabetic retinopathy [Principal Investigator: Dr. S. Krishnakumar]
- ❖ Ocular Biological Senescence evaluation and science study (OBSESS) [Dr. Nivedita Chattarjee]
- ❖ Controlling immunosuppressive properties of T regulatory cells with retinal glia: implications for tubercular uveitis [Dr. Nivedita Chattarjee]
- ❖ Genome wide Transcriptome profiling of Human Retinal Cells under diabetic milieu under the context of Egr-1 expression towards deciphering alternative pathways mediating Retinal Angiogenesis. [Dr. R. Sharada]
- ❖ Impact of Ultra-Violet Radiation and Air Pollution on Ocular Health with Emphasis on Cataract and Pterygium among outdoor workers. [Dr. R. Sharada]
- ❖ Evaluation of novel cell penetrating peptide inhibitors targeting Neuronal Protein 3.1 (P311) in ocular fibrosis using 3D model of Tenon' capsule fibroblasts. [Dr. R.Sharada]
- ❖ Epitranscriptomics of N6-methyl adenosine (m6A) occupied mRNAs in hypoxia-induced retinal endothelial cells: Implications in intraocular vascular diseases [Dr. R.Sharada]



## VISION RESEARCH FOUNDATION

- ❖ Biomechanical effect of Chemotherapeutic drugs on retinoblastoma tumor cells [Dr.J.Narayanan]
- ❖ Smart Polycaprolactone (PCL) Peptide Composite nanofibres for sustained release of 5 Fluoro uracil to modulate wound healing in glaucoma surgery. [Dr.J.Narayanan]
- ❖ Proteomics and Phosphoproteomics of FUCHS Endothelial Cells. [Dr.Sailaja Elchuri]
- ❖ Unravelling the genetic architecture of diabetic retinopathy in the South Indian population. [Dr. S. Mathavan]
- ❖ Discovery of Potential microRNA biomarkers for Macular disease. [Dr. S. Mathavan]
- ❖ Identify of miRNA biomarkers between anti-VEGF responders and non-responders of PDR and diabetes without DR (no DR). [Dr. S. Mathavan]
- ❖ In search of the causative genetic/molecular events in Bardet Biedl syndrome patients excluded for mutations in candidate genes. [Dr. S. Sripriya]
- ❖ A novel molecular screening approach for clinical and molecular characterisation of Usher syndrome patients in India [Dr. S. Sripriya]
- ❖ Mitochondrial genome landscape analysis in an Indian cohort of Lebers Hereditary Optic Neuropathy (LHON) patients negative to primary mutation (G3460A, G11778A, T14484C). [Dr. S. Srilekha]
- ❖ Mesenchymal Stem cell mitochondrial transfer effectively protects mutant Leber's Hereditary Optic Neuropathy (LHON) cells from mitochondrial damage: Molecular and epigenetic screening of LHON patients [Dr. Mohanadevi Subramaniam]
- ❖ Analysis of protective effect of Mesenchymal Stem Cell mitochondrial transfer on mutant Leber's Hereditary Optic Neuropathy (LHON) cells from mitochondrial damage [Dr. Mohanadevi Subramaniam]
- ❖ Screening of mitochondrial transfer and epigenetic markers in Leber hereditary optic neuropathy (LHON) cells for its protective effect from mitochondrial dysfunction. [Dr. Mohanadevi Subramaniam]
- ❖ RNA guided Nucleases targeted genome editing for retinitis Pigmentosa. [Dr. Sowmya Parameswaran]
- ❖ Generation of corneal endothelial cells from induced pluripotent stem cells. [Dr. Sowmya Parameswaran]
- ❖ Injectable self-assembled bruch's membrane mimetic nanofibers for retinal pigment epithelium. [Dr. Sowmya Parameswaran]



## VISION RESEARCH FOUNDATION

- ❖ Generation of oligodendrocytes from induced pluripotent stem cells A step towards cell based therapy for demyelinating diseases. [Dr. Sowmya Parameswaran]
- ❖ Rational Design of novel peptide inhibitors targeting DNA-Topoisomerase-II-Beta through virtual screening of combinatorial peptide libraries and in vitro validation of anticancer efficacies. [Dr. Srujana Chitipothu]

### **Individual Fellowship:**

- ❖ Clinical phenotype guided selection and screening of candidate genes in Leber Congenital Amaurosis patients and Genetic Analysis of X-Linked Recessive Retinitis Pigmentosa families from India. [Dr. S Srilekha; Mentor: Dr. S. Sripriya]
- ❖ Longitudinal assessment of retinal structural and functional changes in individuals with diabetes, with and without diabetic retinopathy. Wellcome Trust/DBT Early Career Fellowship [Dr Sangeetha Srinivasan; Supervisor: Dr Muna Bhende]
- ❖ Development of Myelin oligodendrocyte glycoprotein (MOG) cell-based assay for the detection of antibodies against MOG for differential laboratory diagnosis of optic neuritis. [Dr.P.Durgadevi; Mentor: Dr. K. Lily Therese]
- ❖ A study on genetic regulatory region in DIO3 gene for possible correlation with varying clinical severity in LCA patients. [Dr. N N Srikrupa; Mentor: Dr. S. Sripriya]
- ❖ Development of a novel serological "point -of - care device" to detect AQP-4 antibodies for the differential laboratory diagnosis of neuromyelitioptica (NMO). [Dr. M. Vimalin Jeyalatha; Mentor: Dr. K. Lily Therese]
- ❖ Investigator inflammatory machinery in glia and the role of miRNA on exposure to HIV Tat protein. [Mr. D Durairaj; Mentor : Dr. Nivedita Chattarjee]
- ❖ To delineate the role of copper in mediating inflammation in diabetic retinopathy. [Ms.Aloysius Dhivya M; Mentor: Dr.S.R.Bharathi Devi]
- ❖ Deciphering if impaired autophagy and mitochondrial dysfunction contribute to ECM modifications in primary glaucoma. [Ms. Nikhala Shree S; Mentor: Dr.S.R.Bharathi Devi]
- ❖ Delineating the importance of Neddylation, an ubiquitin-like molecule in maintenance of blood retinal barrier integrity and its function. [Ms. Sruthi Priya Mentor: Dr. R. Sharada]
- ❖ Profiling the promoter methylation status of the candidate genes for ocular quantitative traits in primary glaucoma patients. [Ms. Sukanya K; Mentor: Dr. S. Sripriya]
- ❖ Downstream functional analysis and validation of single nucleotide polymorphism associated with Triamcinolone-acetonide and Dexamethasone-induced ocular hypertension among Indian subjects. [Ms.Lakshmi B; Mentor: Dr.Srujana Chitipothu]



## VISION RESEARCH FOUNDATION

- ❖ Modeling cancers associated with RB1 mutation using human induced pluripotent stem cells [Ms. Ambily Vincent; Mentor: Dr. Sowmya Parameswaran]
- ❖ Molecular and epigenetic screening of Leber's Hereditary Optic Neuropathy(LHON) [Ms. Aswathy P Nair; Mentor : Dr. S Mohana Devi]
- ❖ Studying HIV Mediated Changes at Blood Retinal Barrier on an in vitro Model [Ms. Kamini Khatak; Mentor : Dr. Nivedita Chattarjee]
- ❖ In silico conformational analysis and design of inhibitors targeting LIM kinases in cancer" [Ms.Hemavathy N; Mentor – Dr.Srujana Chitipothu & Dr.J.Jeyakanthan Alagappa University]



## VISION RESEARCH FOUNDATION

### **PARTICIPATION IN CONFERENCES**

- ❖ Dr. J. Narayanan attended the International Webinar on Advances in Physics, Chemistry, Mathematics, Computer Sciences & Biological Sciences (CONIAPS XXVI) organized by Mahatma Gandhi University, Kottayam, Kerala on 20<sup>th</sup> December 2020. He delivered an invited talk on "Targeted therapy for retinoblastoma tumor cells", and he chaired a session, "Recent advances in materials and its application".
- ❖ Dr. S. Srilekha participated in the ARVO 2021 Annual Meeting (Virtual) from May 1<sup>st</sup> to 7<sup>th</sup> 2021. She made a poster presentation entitled "Complete mitochondrial genome sequencing in individuals with Leber hereditary optic neuropathy negative for the common pathogenic mitochondrial DNA mutations".





## VISION RESEARCH FOUNDATION

### **DISTINGUISHED VISITORS**

- ❖ Dr. B.Aarthy and Dr, Raju Sivasamy from SIMS Hospital visited our Molecular Biology lab facility on 21<sup>st</sup> July 2020.
- ❖ Dr. S Prabakaran and Dr. Robert Sam from CSIR-CSIO, CSIR Madras complex, Chennai, visited our Microbiology lab on 9<sup>th</sup> October 2020 for potential collaboration.
- ❖ Dr. K. Ramadevi, Professor of Biochemistry, Director, Institute of Biochemistry, Madras Medical College & Dr. Pramila, Biochemistry Dept, Institute of Child Health and Hospital for Children, Chennai, visited the Biochemistry department on 6<sup>th</sup> January 2021.
- ❖ Dr. Purohit Abhishek from Indore visited our Biochemistry laboratory on 17<sup>th</sup> March 2021.