Global Eye Genetics Consortium

Newsletter #04

Recent Event

The inaugural conference on rare eye diseases in India, organized by the Center for Unknown and Rare Eye Diseases at Dr. Shroff's Charity Eye Hospital, was a landmark event. It brought together leading ophthalmologists, researchers, and healthcare professionals from across the country and around the world. Held in New Delhi, the conference aimed to address the unique challenges posed by rare eye conditions, which often go undiagnosed or misdiagnosed due to their rarity and the lack of awareness among both patients and healthcare providers.

Renowned experts shared the latest research findings, diagnostic techniques, and treatment options for rare eye diseases. Keynote speakers included national and international specialists who provided a global perspective on these conditions. The conference also featured the human side of rare eye diseases, highlighting the importance of patient advocacy and support networks. Patient organizations and advocacy groups played a significant role in the discussions.

The event served as a platform for launching new collaborative research projects aimed at understanding the genetic and environmental factors contributing to rare eye diseases. Participants discussed the creation of a national registry for better data collection and analysis. Additionally, policymakers and representatives from funding agencies were present to discuss strategies for improving access to diagnosis, treatment, and research funding for rare eye diseases in India. The conference emphasized the need for increased government support and public-private partnerships.

Overall, the conference marked a significant step forward in raising awareness, improving diagnosis and treatment, and fostering collaboration in the fight against rare eye diseases in India. It set the stage for ongoing efforts to ensure that patients receive the care and support they need.

CURED

ESTD. 2021

INCLUSIVE CARE FOR ALL

Upcoming Sessions of GEGC in Gobal Forums

Trivia

'Ocular Genetics Word Search'

m	d	z	h	c	o	p	s	v	r	v	e	c	t	o	r	c	t
e	y	j	e	o	j	y	a	e	o	e	h	q	p	r	f	r	z
n	s	w	r	u	m	p	a	l	q	r	c	x	n	o	z	i	x
d	t	a	e	n	m	o	e	x	i	u	e	e	i	j	v	s	p
e	r	i	d	s	u	e	z	d	e	n	e	t	s	z	a	p	l
l	o	c	i	e	t	q	x	y	i	n	d	n	i	s	z	r	r
i	p	a	t	l	a	n	b	o	g	g	f	r	c	g	i	a	n
a	h	r	a	l	t	w	y	u	m	o	r	e	o	i	e	v	n
n	y	d	r	i	i	k	f	y	s	e	u	e	l	m	n	n	e
f	w	i	y	n	o	f	f	x	h	z	e	s	e	d	i	g	e
z	n	w	g	g	n	n	g	e	n	o	t	y	p	e	i	c	f
g	y	x	k	a	r	y	o	t	y	p	e	q	d	w	a	f	c

Find the following words in the puzzle.
Words are hidden→ ↓and↘

counselling
palindromic
hereditary
homozygous
sequencing
voretigene
karyotype
recessive
mendelian
dystrophy
axenfeld
genotype
pedigree
mutation
aicardi
crispr
vector
exome

Meet Our Members

Dr. Viney Gupta, a distinguished professor at the Glaucoma services department of Dr. Rajendra Prasad Center for Ophthalmic Science, All India Institutes of Medical Sciences, New Delhi, brings a wealth of expertise to his role. He honed his skills through a Glaucoma Fellowship at the Royal Victoria Eye and Ear Hospital, Melbourne, Australia, and holds an MBA from Delhi University.

Dr. Gupta's professional focus encompasses a range of specialized interests within glaucoma, including congenital glaucomas, juvenile glaucomas, surgical glaucomas, and glaucoma genetics. His commitment to advancing the field is evident through his extensive publication record, boasting over 220 indexed publications in glaucoma in peer-reviewed journals.

In addition to his research contributions, Dr. Gupta actively participates in shaping the academic landscape as an Associate Editor for the Indian Journal of Ophthalmology (IJO) and serves on the Editorial board of AJO case reports & EYE. Moreover, he plays a pivotal role in fostering collaboration and knowledge exchange as the founding President of the Indian Pediatric Glaucoma Society.

Dr. Gupta's multifaceted approach to glaucoma care, blending clinical expertise with academic leadership, underscores his dedication to improving patient outcomes and advancing the field of ophthalmology.

Dr. P. Sundaresan received his Ph.D in Microbiology from Madurai Kamaraj University, Madurai in 1990 and served as Lecturer for two years at Birla Institute of Science and Technology, Pilani, Rajasthan, India. He then moved to the U.S and served as a post-doctoral fellow at the University of Pennsylvania, Philadelphia, (1993-1995) and Georgetown University, Washington DC (1996-1998). He worked as a Research Assistant Professor at the School of Medicine, Mount Sinai, New York (1999- 2000). Dr. Sundaresan's postdoctoral training was on structure-function of Herpes simplex virus-1 glycoprotein gE; HSV-1: Viral Gene therapy for brain and prostate cancer and making Herpes Simplex Virus-2 gB -2 recombinant viruses to study cell entry.
Dr. P. Sundaresan's research focuses on the Molecular Genetics of eye diseases and molecular diagnosis for inherited eye diseases. His specific areas of research include molecular genetics on Aniridia, POAG, PACG, BPES, CHED, Diabetic Retinopathy; Ocular Albinism and Age-related Macular Degeneration, FEVR, LHON, Congenital and Age-related cataracts and Identification of Biomarkers for Primary Open Angle Glaucoma.

He has published greater then 150 scientific papers in peer-reviewed national and international journals. He is a recognized Ph.D supervisor under Madurai Kamaraj University, The Tamil Nadu Dr. M. G. R Medical University, Alagappa University and Sastra University. He has guided 20 scholars and currently 4 Research scholars are working under his guidance. He has been awarded the Biotechnology Overseas Associateship Award (2005-2006) and CREST award (2010-2011) from the Ministry of Science and Technology, DBT, Govt. of India. He has received 2 ICMR awards: (1) for Biomedical Research for scientists belonging to underprivileged communities for the year 2006 and (2) for Biomedical research conducted in underdeveloped areas for the year 2009 and also received the Tamil Nadu Scientist Award (TANSA 2013) under the discipline of Biological Sciences. In addition, received the Hari Om Ashram Alembic Research Award (Medical Council of India) for 2010 from the Honourable President of India at Rashtrapati Bhawan. He has received funding for research from the Government of India (ICMR, NMITLI-CSIR, DST, and DBT) and Wellcome Trust.

Dr. Orwa Nasser is an accomplished ophthalmologist and surgeon with impressive qualifications and experience. He holds a Medical Doctorate from the Hadassah Faculty of Medicine at the Hebrew University of Jerusalem, completed in 2008, and a Master's degree in Public Health from the same institution in 2010. His commitment to specialization led him to residencies and fellowships in renowned medical centers in Israel and the United States.

During his residency in ophthalmology at Bnei Zion Hospital in Haifa from 2010 to 2014, Dr. Nasser honed his skills in various aspects of eye care. His pursuit of excellence took him to the United States for four years of intensive fellowship training. In his first year, he focused

on pediatric ophthalmology, strabismus, and nystagmus at Akron Children's Hospital in Ohio, under the mentorship of Prof. Richard Hartle, a distinguished expert in nystagmus surgery. He further specialized in pediatric ophthalmology and strabismus at the University of Iowa Hospitals and Clinics, a globally renowned institution for eye care.

Dr. Nasser then pursued a second fellowship in cornea, cataract, anterior segment of the eye, and refractive surgery at UTSW Medical Center in Texas, one of the largest and most prestigious eye departments in the United States. During this period, he gained extensive experience in corneal disease, cataract surgery, refractive surgery, and eye trauma.

Upon returning to Israel in late 2019, Dr. Nasser established a world-class eye care center called ORASIS, offering various services and treatments for different eye conditions. As the medical director, he treats conditions like cataracts, performs refractive surgery, and specializes in cornea and pediatric ophthalmology, particularly strabismus. Additionally, Dr. Nasser is a nystagmus specialist and expert, providing both surgical and non-surgical treatments for various types of nystagmus. His leadership and expertise significantly advance eye care in his community.

Dr. Nasser is dedicated not only to clinical practice but also to academic pursuits and humanitarian efforts. He is involved in various global and local ophthalmology organizations, contributing to research, education, and professional development. His commitment to humanitarian work is evident through his volunteer efforts, providing eye surgeries for adults and children in underserved communities. With his comprehensive skill set, extensive experience, and compassionate approach, Dr. Orwa Nasser continues to make significant contributions to ophthalmology both locally and globally.

Prof. Dr. Raheel Qamar is an accomplished researcher and academic with expertise in biochemistry, molecular biology, and genetic engineering. After completing his M.Sc. in Biochemistry from the University of Peshawar, he worked as a Scientific Officer at the National Institute of Health, Islamabad, Pakistan. Prof. Qamar then pursued his Ph.D. at the Department of Biochemistry Molecular Biology at the University of North Texas, United States of America.

Upon completing his Ph.D., he returned to Pakistan and joined Dr. A. Q. Khan Research Laboratories, where he rose to the position of Principal Scientific Officer. He also spent time at the University of Oxford, working with Dr. Chris Tyler-Smith in the lab of Prof. E.M. Southern.

Prof. Qamar then joined Shifa College of Medicine as an Assistant Professor of Biochemistry and was later promoted to Associate Professor. He also served as the Director of PCR Labs and Research Director at Shifa College of Medicine. Subsequently, he joined COMSATS Institute of Information Technology (CIIT), where he held the position of Tenured Professor of Biosciences and served as the Chair of the Department of Biosciences before being appointed as the Dean of the Faculty of Sciences and subsequently the Dean of Research and Innovation. After this the Board of Governors of CIIT appointed him the Rector of the Institution, during his tenure, he was successful in obtaining substantial developmental funding and the charter of a Federal University for CIIT, which was then named COMSATS University Islamabad.

Prof. Qamar's research interests lie in enzymology, population genetics, molecular genetics, and molecular pathology, with a particular focus on investigating the molecular basis of inherited diseases in Pakistani populations. He leads a dynamic research group consisting of Ph.D. and M.S. students, Assistants, and Associate Professors, working on various projects aimed at elucidating the genetic mechanisms underlying inherited diseases, the lab specializes in Ophthalmogenetics. His contributions to the field have significantly advanced our understanding of molecular genetics and pathology, particularly in the context of Pakistani populations.

In recognition of his serves to Science, the President of Pakistan awarded him one of the highest civil awards of the country the Tamgha-e-Imtiaz (Medal of Excellence). Currently, he is working as the Head of the Science and Environment Sector at the Islamic World Educational, Scientific and Cultural Organization which develops capacities in its 53 member countries spread over Asia, the Middle East, Africa and South America."

Ophthalmic Genetics News

Around the World

FDA grants clearance for IND Application for the treatment of Geographic Atrophy

The Food and Drug Administration (FDA) of the USA has granted clearance to 4D Molecular Therapeutics for its investigational new drug (IND) application for 4D-175, an R100 vector-based intravitreal genetic medicine for treating patients with geographic atrophy (GA). This company focuses on unlocking the full potential of genetic medicines to treat large-market diseases. GA is characterized by atrophic lesions in the outer retina that affect central vision and lead to irreversible vision loss. Progressive loss of central vision leads to difficulties in driving, reading, and completing basic daily tasks. As a result, GA has a major impact on the quality of life. Complement-mediated inflammation is recognized as a main contributor to the development and worsening of GA. The only FDA-approved treatments for GA are complement inhibitors administered by intravitreal (IVT) injection once every 4-9 weeks.

According to the Co-founder and Chief Executive Officer of 4DMT, David Kirn, GA is a leading cause of irreversible vision loss affecting over 5 million people globally. He stressed that current bolus complement inhibitor treatments, given monthly or bimonthly via intravitreal injections, reduce the rate of growth in GA lesions but without any demonstrable functional vision benefit. In contrast, the IND has the potential to offer durable clinical benefits with a single injection at one of three dose levels, reducing the treatment burden and potentially leading to better long-term vision outcomes. The Phase 1 GAZE clinical trial will assess 4D-175 in patients who have GA secondary to age-related macular degeneration (AMD), with the aim of exploring safety, tolerability, biological activity, and transgene expression levels to select appropriate doses for phase 2, with enrollment beginning in the latter half of 2024.

4D-175 combines the customized and evolved intravitreal vector, R100, and a codon-optimized transgene encoding a highly functional shortened form of human complement factor H (sCFH). The genetic medicine candidate is designed to provide durable transgene expression in the retina without significant inflammation following a single, low-dose intravitreal injection. The sCFH transgene, an engineered and optimized version of CFH, fits into adeno-associated virus (AAV) vectors and has shown robust expression and full functionality in human cells and in various preclinical animal models in vivo. This approach aims to restore normal complement regulation and reduce retinal injury associated with GA. Indeed, data from 4D-175's preclinical studies were presented in May 2024 at the Annual Scientific Meeting of the Association for Research in Vision and Ophthalmology (ARVO).

Source:-
https://eyewire.news/news/4dmt-receives-fda-clearance-of-ind-application-for-4d-175-genetic-medicine-for-the-treatment-of-ga

AND

Press Releases | 4D Molecular Therapeutics (gcs-web.com)

Ocugen Inc starts dosing of first patient in OCU400 Phase 3 clinical Trial For Retinitis Pigmentosa(RP)

Ocugen announced that the USA Food and Drug Administration (FDA) has cleared the company's investigational new drug (IND) amendment to initiate a Phase 3 clinical trial of OCU400, and to that effect, started dosing patients in its Phase 3 liMeliGhT clinical trial for OCU400, a gene therapy candidate for retinitis pigmentosa (RP). OCU400 is the first gene therapy program to enter Phase 3 with a broad RP indication. Ocugen, Inc. is a biotechnology company focused on discovering, developing, and commercializing novel gene and cell therapies and vaccines that improve health and offer hope for patients across the globe.

OCU400 represents Ocugen's modifier gene therapy approach, which is based on nuclear hormone receptors (NHRs) that regulate diverse physiological functions, such as homeostasis, reproduction, development, and metabolism to potentially improve retinal health and function. Dr. Shankar Musunuri, Chairman, CEO, and

Co-founder of Ocugen, emphasized that each milestone with OCU400 brings them closer to offering a one-time, lifelong treatment for RP patients. The trial is based on positive Phase 1/2 data showing improvements in visual acuity and mobility tests. In the earlier trial, 89% of RP patient subjects demonstrated stabilization or improvement in the treated eye either on best corrected visual acuity (BCVA), low-luminance visual acuity (LLVA), or multi-luminance mobility testing (MLMT) scores from baseline; 80% of RHO mutation subjects experienced either stabilization or improvement in MLMT scores from baseline; and 87% of subjects showed stabilization or improvement in treated eyes in MLMT scores from baseline. These results indicate that OCU400 could be effective against various genetic mutations associated with RP.

The Phase 3 trial will last one year and include 150 participants, divided into two groups: one with RHO gene mutations and the other gene-agnostic. Patients, 8 years and older, with early through late-stage advancement of RP, are being recruited to participate in the liMeliGhT study. Participants will be randomized 2:1 to receive either the treatment or be in the control group. The primary endpoint is the Luminance Dependent Navigation Assessment (LDNA) focusing on the proportion of responders achieving significant improvement in vision. OCU400 has received orphan drug and RMAT (Regenerative Medicine Advanced Therapy) designations from the FDA, and the EMA (European Medicines Agency) has accepted the US-based trial for a future Marketing Authorization Application (MAA). Receiving RMAT designation offers sponsor companies all the benefits of the fast track and breakthrough therapy designation programs, including early interactions with the FDA. The trial aims to meet its approval targets by 2026. If successful, OCU400 could transform the lives of RP patients by offering a long-lasting solution to an incurable condition.

Ocugen, Inc. Announces U.S. FDA Clearance of IND Amendment to Initiate OCU400 Phase 3 Clinical Trial — First Gene Therapy to Enter Phase 3 with a Broad Retinitis Pigmentosa Indication | Ocugen, Inc.
https://eyewire.news/news/ocugen-doses-first-patient-in-phase-3-clinical-trial-for-ocu400-gene-therapy-for-retinitis-pigmentosa

Recent publications of GEGC members

1. Chan CC. Global collaboration of eye research: -personal experience. Int J Ophthalmol. 2024;17(6):985-990. Published 2024 Jun 18. doi:10.18240/ijo.2024.06.01 (Full text Available in Pubmed)

Dr. Chi Chao Chan

In this article Dr. Chi Chao Chan provides her personal experience in global collaborations in eye research. The article underscored the importance of international cooperation in advancing eye research, with significant contributions from global leaders and experts in the field. Modern research often involves collaboration among researchers with varying levels of experience, funding, and organizational backgrounds . This complexity requires a broad range of skills and often incurs costs, including financial expenses and time management. Navigating these collaborations, particularly on an international scale, can be challenging due to cultural and moral differences. Cross-border partnerships typically involve policymakers, administrators, and funding agencies. Despite these challenges, such collaborations enhance research quality and contribute to better health outcomes

2. Subramani J, Patlolla N, Battu R, Saiyed T, Pal R. Generation and characterization of retinal pigment epithelium from patient iPSC line to model oculocutaneous albinism (OCA)1A disease. J Biosci. 2024;49:21. (Full text Available in Pubmed)

Dr. Rajarshi Pal

Oculocutaneous albinism (OCA) is characterized by reduced melanin biosynthesis, impairing visual function. Due to the lack of suitable biological models, understanding OCA at the cellular level is challenging. This study developed an in vitro model for OCA type 1A, the most severe form caused by TYR gene mutations, using retinal pigment epithelium (RPE) cells derived from patient-induced pluripotent stem cells (hiPSCs). Compared to healthy RPE cells, OCA1A RPE cells failed to pigment and showed melanosome-specific defects. Immunocytochemistry and quantitative assays confirmed the absence of melanin synthesis and tyrosinase activity. RNA sequencing revealed differential gene expression, highlighting the model's potential for understanding OCA mechanisms and identifying therapeutic targets.

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