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TFOS Lifestyle Report Introduction: A Lifestyle Epidemic - Ocular Surface Disease

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1. Background

Lifestyle defines how a person lives. While the way we live can impact our environment, the environment can influence the way we live, and both can affect our health. The ocular surface, and in particular the tear film, is susceptible to modifications due to its external (e.g. environmental conditions, lifestyle and societal challenges, and the digital environment), applied (e.g. contact lens wear and cosmetics) or internal (e.g. nutrition, and elective medications and procedures) environments. Consequently, it is critical for clinicians to understand the impact of lifestyle choices on the ocular surface so that they can communicate with their patients to optimize their health and, wherever possible, institute preventative steps to mitigate potential health risk factors.

To increase awareness of the potential impacts of lifestyle choices on ocular surface health, the Tear Film & Ocular Surface Society (TFOS) launched the TFOS Workshop entitled "A Lifestyle Epidemic: Ocular Surface Disease." Consistent with prior TFOS Workshops [1–4], the aim was to review existing literature, to identify gaps in knowledge and to propose future directions for research, with the long-term goal of

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Table 1
Steering committee members.

Craig, Jennifer P. (Chair; New Zealand)
Alves, Monica (Vice Chair; Brazil)
Sullivan, David A. (Organizer; USA)
Downie, Laura E. (Australia)
Efron, Nathan (Australia)
Galor, Anat (USA)
Gomes, José A.P. (Brazil)
Jones, Lyndon (Canada)
Markoulli, Maria (Australia)
Stapleton, Fiona (Australia)
Starr, Christopher E. (USA)
Sullivan, Amy Gallant (USA)
Willcox, Mark D.P. (Australia)
Wolffsohn, James S. (UK)

improving the lives of individuals affected by ocular surface disease around the world.

Under the leadership of the Workshop Chair Jennifer Craig, Vice Chair Monica Alves, and Organizer David Sullivan, a Steering Committee was formed (Table 1) to plan and execute this *TFOS Lifestyle Workshop*. The Steering Committee was committed to an evidence-based approach and a process of open communication, dialogue and transparency, to achieve a consensus concerning the relationship(s) between lifestyle factors and their impact on ocular surface disease.

2. Workshop process

Eleven Subcommittees were created by the Steering Committee (Table 2).

Eight Subcommittees were established on key topic areas (Table 2A) deemed to play a role in causing or perpetuating ocular surface disease. Like previous TFOS consensus workshops, Public Awareness and Industry Liaison Subcommittees were also formed (Table 2B), and, as a novel initiative within the *TFOS Lifestyle Workshop*, an Evidence Quality Subcommittee was established. This Evidence Quality Subcommittee was tasked with advancing the evaluation and synthesis of research evidence in the topic area reports, and facilitating appropriate presentation of current high quality, relevant literature [5]. Its members provided the wider Workshop membership with access to expertise and methodological support to help conduct the narrative-style literature reviews for each report; this included the curation and supply of topic-specific databases of systematic reviews together with a reliability assessment to help guide the individual topic area Subcommittees in reporting reliable systematic review evidence. The Evidence Quality Subcommittee members also each guided the undertaking of a systematic review on a priority, focused research question, which was integrated into each topic area report.

Workshop membership comprised nominated (including self-nominated) experts who were then selected based on their demonstrated clinical and/or basic science research skills in the field of ocular surface disease, and/or skills in evidence synthesis, as well as geographic and demographic diversity, with the individual Subcommittee membership formed predominantly of those with expertise relevant to the specific topics listed above. The Workshop involved a total of 158 members from 38 countries around the world (Table 3). Some Workshop members had roles on more than one Subcommittee.

Table 2
TFOS Lifestyle Workshop topic area Subcommittees (A) and supporting Subcommittees (B). Values in parentheses indicate member counts for each committee (counts are not mutually exclusive).

A. Topic Area Subcommittees
Contact Lenses (16)
Cosmetics (15)
Digital Environment (14)
Elective Medications and Procedures (14)
Environmental Conditions (14)
Lifestyle Challenges (13)
Nutrition (18)
Societal Challenges (14)
B. Supporting Subcommittees
Evidence Quality (10)
Industry Liaison (19)
Public Awareness (22)

In contrast to previous TFOS Workshop initiatives, the majority of interactions at the outset of the *TFOS Lifestyle Workshop* in April 2021 were virtual due to international travel restrictions associated with the COVID-19 pandemic. Through virtual meetings and email communications, the Chairs of the eight topic area Subcommittees guided their members to first develop a draft outline of the proposed content of their respective report. Outlines were subsequently refined on the basis of feedback from the wider membership and Steering Committee review to ensure comprehensive coverage of the topic without significant overlap with the proposed content of other Subcommittee reports. Evidence Quality Subcommittee members offered guidance as required with the narrative review process and preliminary reports were then drafted and circulated for review by the membership. In parallel with the narrative review, members of each topic area Subcommittee worked with assigned member(s) of the Evidence Quality Subcommittee to answer a unique key question, proposed by each individual Subcommittee, (Table 4), using systematic review methodology. Questions sought to identify a topic of current relevance to clinicians and researchers, with growing published evidence. These prospectively registered systematic reviews are embedded within each of the reports.

In September 2022, the first in-person meeting was held and attended by almost two-thirds of the Workshop membership. At this meeting, summaries of the Subcommittee reports were presented by the Chairs of the Subcommittees for critical review by the membership. All members were invited to comment and provide input into the content and interpretation of the written and presented reports, as a component of the peer-review process.

Harmonization of the reports was an important penultimate stage of the review process, where nominated individuals (listed in Table 3) checked that membership review queries were addressed, and provided detailed review and critique of the reports, to endorse accuracy in the evidence reporting and promote consistency in the delivery format of the reviews. Following harmonization and before submission for publication, the reports underwent penultimate revision by the Subcommittee Chairs, final review by the wider membership, and final checking by the Executive Team (Workshop Chair, Vice Chair and Organizer).

3. Subcommittee considerations and scope

For the purpose of the *TFOS Lifestyle Workshop*, the 'ocular surface' was defined as the cornea, limbus, conjunctiva, eyelids and eyelashes, lacrimal apparatus and tear film, along with their associated glands and muscular, vascular, lymphatic and neural support. 'Ocular surface disease' was deemed to include established diseases affecting any of the listed structures, as well as etiologically-related perturbations and responses associated with these diseases. Subcommittees focused on their topic area, each of which was deemed a lifestyle-related contributor to ocular surface disease. The rationale for, and scope of, each topic area is described, in turn.

3.1. Contact lenses

Contact lenses have the capacity to enhance the lifestyle of individuals and improve esteem [6]. They are prescribed primarily for the correction of refractive errors [7], including the control of myopia progression, but also for many other reasons, including medical indications. It is estimated that approximately 150 million people wear contact lenses globally and for those wearing contact lenses, numerous factors will govern wearer success [8–10]. The *TFOS Lifestyle: Impact of*

Table 3
TFOS Lifestyle Workshop Subcommittee members.

Contact lenses
Jones, Lyndon (Co-chair; Canada)
Efron, Nathan (Co-chair; Australia)
Bandamwar, Kalika (New Zealand)
Barnett, Melissa (USA)
Jacobs, Deborah (USA)
Jalbert, Isabelle (EQS; Australia)
Pult, Heiko (Germany)
Rhee, Michelle (USA)
Sheardown, Heather (Canada)
Shovlin, Joseph (USA)
Stahl, Ulli (Canada)
Stanila, Adriana (Romania)
Tan, Jacqueline (Australia)
Tavazzi, Silvia (Italy)
Uckakhan, Omur (Turkey)
Willcox, Mark D.P. (Australia)
Downie, Laura E. (Harmonizer; Australia)

Cosmetics
Sullivan, David A. (Chair; USA)
da Costa, Alexandre (Brazil),
Del Duca, Ester (USA)
Doll, Tracy (USA)
Grupcheva, Christina (Bulgaria),
Lazreg, Sihem (Algeria)
Liu, Su-Hsun (EQS; USA)
McGee, Selina (USA)
Murthy, Rachna (UK),
Narang, Purvasha (India)
Ng, Alison (Canada)
Nistico, Steven (Italy)
O'Dell, Leslie (USA)
Roos, Jonathan (UK)
Shen, Joanne (USA)
Markoulli, Maria (Harmonizer; Australia)

Digital Environment
Wolffsohn, James S. (UK)
Lingham, Gareth (EQS; Ireland)
Downie, Laura (Australia)
Huntjens, Byki (UK)
Inomata, Takenori (Japan)
Jivraj, Saleel (Canada)
Kobia-Acquah, Emmanuel (Ireland)
Muntz, Alex (New Zealand)
Mohamed-Noriega, Karim (Mexico)
Plainis, Sotiris (Greece)
Read, Michael (USA)
Sayegh, Rony (USA)
Singh, Sumeer (EQS; Australia)
Utheim, Tor Paaske (Norway)
Craig, Jennifer P. (Harmonizer; New Zealand)

Elective Medications and Procedures
Gomes, José A.P. (Chair; Brazil)
Azar, Dimitri (Vice-Chair; USA)
Baudouin, Christophe (France)
Bitton, Etty (Canada)
Chen, Wei (China)
Hafezi, Farhad (Switzerland)
Hamrah, Pedram (USA)
Hogg, Ruth (EQS; UK)
Horwath-Winter, Jutta (Austria)
Kontadakis, Georgios (Greece)
Mehta, Jodhbir (Singapore)
Messmer, Elisabeth (Germany)
Perez, Victor (USA)
Zadok, David (Israel)
Willcox, Mark D.P. (Harmonizer; Australia)

Environmental Conditions
Alves, Monica (Chair; Brazil)
Asbell, Penny (USA)
Dogru, Murat (Japan)
Giannaccare, Giuseppe (Italy)
Grau, Arturo (Chile)
Gregory, Darren (USA)
Kim, Dong Hyun (South Korea)
Marini, Maria Cecilia (Argentina)
Ngo, William (Canada)
Nowinska, Anna (Poland)
Saldanha, Ian (EQS; USA)
Villani, Edoardo (Italy)
Wakamatsu, Tais Hitomi (Brazil)
Yu, Mitasha (Australia)
Stapleton, Fiona (Harmonizer; Australia)

Lifestyle Challenges
Galor, Anat (USA)
Britten-Jones, Alexis Ceecee (EQS; Australia)
Feng, Yun (China)
Ferrari, Giulio (Italy)
Goldblum, David (Switzerland)
Gupta, Preeya (USA)
Merayo-Lloves, Jesus (Spain)
Na, Kyung-Sun (South Korea)
Naroo, Shehzad (UK)
Nichols, Kelly (USA)
Rocha, Eduardo (Brazil)
Tong, Louis (Singapore)
Wang, Michael (New Zealand)
Craig, Jennifer P. (Harmonizer; New Zealand)

Nutrition
Markoulli, Maria (Chair; Australia)
Ahmad, Sumayya (USA)
Arcot, Jayashree (Australia)
Arita, Reiko (Japan)
Benitez-del-Castillo, Jose (Spain)
Caffery, Barbara (Canada)
Downie, Laura (EQS; Australia)
Edwards, Katie (Australia)
Flanagan, Judith (Australia)
Labetoulle Marc (France)
Misra, Stuti (New Zealand)
Mrugacz, Malgorzata (Poland)
Singh, Sumeer (EQS; Australia)
Sheppard, John (USA)
Vehof, Jelle (The Netherlands)
Versura, Piera (Italy)
Willcox, Mark D.P. (Australia)
Ziemanski, Jillian (USA)
Wolffsohn, James S. (Harmonizer; UK)

Societal Challenges
Stapleton, Fiona (Chair; Australia)
Abad, Juan Carlos (Colombia)
Barabino, Stefano (Italy)
Burnett, Anthea (Australia)
Iyer, Geetha (India)
Lekhanont, Kaevalin (Thailand)
Li, Tianjing Li (EQS; USA)
Liu, Yang (China)
Navas, Alejandro (Mexico)
Obinwanne, Chukwuemeka Junior (Nigeria)
Qureshi, Riaz (USA)
Roshandel, Danial (Australia)
Sahin, Afsun (Turkey)
Shih, Kendrick (Hong Kong)
Tichenor, Anna (USA)
Jones, Lyndon (Harmonizer; Canada)

Public Awareness
Starr, Christopher E. (Chair; USA)
Akpek, Esen (USA)
Awdeh, Richard (USA)
Begovic, Enesa (Bosnia and Herzegovina)
Bogetti, Tamara (USA)
Budimlija, Nikolina (Ireland)
Cusnir, Valeriu (Moldova)
Farrant, Sarah (UK)
Filipe, Helena (Portugal)
Gupta, Noopur (India)
Hamada, Samer (UK)
Liu, Wei (China)
Pucker, Andrew (USA)

(*continued on next page*)

Table 3 (*continued*)

Rayner, Jennifer (Australia)
Shah, Sheetal (USA)
Shaheen, Mohamed Shafik (Egypt)
Shen Lee, Bridgitte (USA)
Theriot, Pamela (USA)
Wade, Matthew (USA)
Walsh, Karen (USA)
Xie, Huatao (China)
You, Jingjing (Australia)
Industry Liaison
Sullivan, Amy Gallant (Chair; USA) (ESSIRI Labs)
Basuthkar, Subam (CooperVision)
Bruckmueller, Petra (ESW-Vision)
Chao, Jiang (Jessica) (Shenyang Sinqi Pharmaceutical)
Courey, Claudine (Eye Drop Shop)
Cooper, Michael (Kala Pharmaceuticals)
Duprat, Laura (Allergan an AbbVie Company)
El Assaad, Marc (Santen)
Gross, Dorothea (Ursapharm)
Haque, Sameena (Novartis)
Kissling, Robert (Bausch + Lomb)
Mack, Carla (Alcon)
McCutcheon, Vanessa (CSL Seqirus)
McEwen, Blair (I-MED Pharma)
Mottiwala, Aziz (Tarsus Pharmaceuticals)
Noirt, Florence (Laboratoires Théa)
Parks, Andrew (Sun Pharmaceutical Industries)
Pasedis, Georgea (Dompé)
Szaronos, Adam (Trukera Medical)

Key: EQS, Evidence Quality Subcommittee.

contact lenses on the ocular surface report investigates the contact lens choices that impact the ocular surface and the lifestyle choices that may impact contact lens wear and success [11]. A wide variety of lifestyle issues are considered in this review. The findings serve as a guide to assist eye care practitioners in optimizing the contact lens wearing experience for individual patients, to enhance their lifestyle in terms of optical refraction, ocular health, eye safety, convenience and lens wear utility.

3.2. Cosmetics

Eye cosmetics have been in use for many millennia [12], yet remain remarkably unregulated throughout the world. They can be used across an individual's lifespan and can contribute to esteem, be used to display personality and have cultural or religious significance [13]. The *TFOS Lifestyle: Impact of cosmetics on the ocular surface* report [14] addresses multiple aspects of eye cosmetics, including their history and market value, psychological and social impacts, and potential problems associated with numerous cosmetic ingredients that may act as allergens, carcinogens, endocrine disruptors, immunosuppressants, irritants, mutagens, toxins and/or tumor promoters, and may damage the ocular surface and adnexa. The report also addresses possible adverse effects associated with cosmetic products (such as concealers, conditioners, creams, extensions, eyeliners, foundations, glues, mascaras, primers, removers, serums, shadows, and toners) and procedures (including eyelash curling, dyeing, tinting, and perming, botulinum toxin, filler and platelet-rich plasma injections, chemical peels, conjunctival tattooing, eyelid piercing and tattooing, microdermabrasion, microneedling, and skin resurfacing and tightening), and reviews regulations for eye cosmetic use.

3.3. Digital Environment

The digital environment has become ubiquitous. It is well established that eye blink rate decreases and partial blinking is more common when using digital screens [15]; these changes have been associated with increased risk to the ocular surface [16]. The *TFOS Lifestyle: Impact of the digital environment on the ocular surface* report [17] explores the prevalence of digital eye strain, based on the available literature, and raises challenges arising from the lack of specificity of current diagnostic questionnaires to symptoms experienced in, or exacerbated by, the digital environment. The review examines evidence for possible inciting factors, such as device characteristics (fixed: display style, screen resolution, contrast and size; adjustable: illuminance, font size and contrast, and screen distance), intensity of the activity (high cognitive demand, prolonged screen time and lack of breaks) and adjuvating factors (pre-existing dry eye disease, other eye disease, contact lens use, age, sex, sleep duration and the environment). From this in-depth review, differential diagnoses, assessment and mitigations are proposed, along with current evidence on the most effective management options.

Table 4
Key clinical questions evaluated using systematic review methodology.

Subcommittee	Key question
Contact lenses	What lifestyle factors are associated with people dropping out of contact lens wear?
Cosmetics	Is the use of eyelash growth serums associated with symptoms and/or signs of ocular surface disease?
Digital environment	Which ocular surface disease management approaches reduce symptoms associated with digital device use?
Elective medications and procedures	What is the impact of SMILE refractive surgery on quality of life?[a]
Environmental conditions	What is the association between outdoor environment pollution and dry eye disease symptoms and/or signs in humans?
Lifestyle challenges	Are chronic primary pain disorders associated with dry eye disease?
Nutrition	What are the effect(s) of different forms of intentional food restriction on ocular surface health?
Societal challenges	Has the COVID-19 pandemic changed the severity or outcome of ocular surface disease?

Abbreviation: COVID-19, Coronavirus Disease 2019; SMILE, small incision lenticule extraction.
[a] Scope limited to a single form of refractive surgery in the report.

3.4. Elective medications and procedures

Iatrogenic effects on the tear film and ocular surface, arising from a myriad of prescribed medications and medically-warranted surgical procedures, are well recognized [18], but similar risks to the ocular surface can exist from the use of non-prescribed topical and systemic medications, complementary and alternative medicines, appearance-enhancing elective surgeries and even non-ophthalmic surgical procedures. The *TFOS Lifestyle: Impact of elective medications and procedures on the ocular surface* report [19] explores evidence of the impact of non-urgent or non-essential interventions on the ocular surface, provides an overview of the management or prophylaxis of ocular surface disease based on the current literature and makes suggestions for future directions to address gaps in knowledge.

3.5. Environmental conditions

Environmental conditions are affected by external weather patterns (such as sunlight, temperature, humidity, windspeed, altitude and water vapors), allergens in the atmosphere and pollution (such as gases, particulate matter, pollen and dander), as well as factors such as air-conditioning and central heating that are used in controlled indoor spaces. The proximity of the ocular surface to environmental hazards presents a significant risk of disrupting tear film and ocular surface homeostasis, which can trigger diseases and symptoms. While indoor and outdoor environments differ in many respects, their ocular surface impacts are often comparable, presenting a wide range of opportunity to exposure. The *TFOS Lifestyle: Impact of environmental conditions on the ocular surface* report [20] examines evidence surrounding the impact of environmental conditions on the ocular surface through toxicity,

irritation, thermal damage and evaporation.

3.6. Lifestyle challenges

Beyond the lifestyle choices that individuals might actively choose to pursue or adopt, a modern lifestyle presents a myriad of additional challenges that may play a role in triggering or exacerbating ocular surface disease. With distinct and overlapping effects on the ocular surface, the domains considered within the *TFOS Lifestyle: Impact of lifestyle challenges on the ocular surface* report [21], are mental health (including depression, anxiety, stress, coping and resiliency, and sleep disorders), physical health (including inactivity, chronic pain, obesity, pregnancy, sexual issues, obesity, mask-associated dry eye, and eye rubbing) and social health (including tobacco, cannabis and other recreational drug use).

3.7. Nutrition

Nutrition is essential to life but eating habits have changed radically over generations, with potential to impact the health of the ocular surface [22]. The *TFOS Lifestyle: Impact of nutrition on the ocular surface* report [23] summarizes the key elements of nutrition as macronutrients (carbohydrates, lipids, and proteins), micronutrients (vitamins and minerals), and water. Excipients, additives and non-nutritional components (including alcohol consumption and dietary supplements) can also potentially impact ocular health. Other aspects of nutrition include caloric restriction (dieting), regional diets, eating disorders, over-nutrition, food allergies and demographics (age, sex, ethnicity, socioeconomic factors). Many systemic disorders are affected by diet and nutrition and may themselves further affect the body's uptake, processing and distribution of nutrients [24,25]. The report examines whether these factors, metabolic disorders (such as obesity, cardiovascular disease, and chronic kidney disease) and gastrointestinal disorders (such as inflammatory bowel and celiac disease) are associated with an increased risk of ocular surface disease.

3.8. Societal challenges

Societal factors can influence the way in which ocular surface diseases present and are managed. Taking an approach that is intended to facilitate intervention at a health policy level, the *TFOS Lifestyle: Impact of societal challenges on the ocular surface* report describes the impact of societal challenges on ocular surface diseases using an adaptation of a framework that maps the relationship between the individual, their environment, and their health [26]. Looking beyond the direct impacts of individual lifestyle factors on the ocular surface that are comprehensively described in the other *TFOS Lifestyle Workshop* reports, this report reviews evidence on how lifestyle factors contribute to societal norms in terms of education, and access to, or uptake of, services, for example, each of which can influence the presentation, prioritisation and management of ocular surface disease.

4. Disseminating the *TFOS Lifestyle Workshop* outcomes

Dissemination of the peer-reviewed scientific Workshop reports is critical to the TFOS mission to improve patient health through education. Therefore, as with previous TFOS Workshops, a Public Awareness Subcommittee was established. The role of its members, following publication of the *TFOS Lifestyle Workshop* reports, is to facilitate distribution of the evidence-based outcomes of the reports in a variety of formats, including in non-technical language, to suit a wide variety of stakeholders, from non-eye healthcare workers to eyecare professionals, and to the public. As with prior TFOS reports the intention is to widely disseminate and publicize the outcomes and recommendations across the world via scientific meetings and continuing education conferences for eyecare professionals, in professional trade journals and eye care magazines, and through all forms of social, online and traditional media. Where possible, with the support of industry partners, the *TFOS Lifestyle Workshop* reports and summaries will be translated into multiple languages, as with previous TFOS Workshop reports.

5. Workshop sponsorship

Consensus reports such as the TFOS reports would not be possible without the generous support of industry partners, who assist TFOS in achieving its objectives through unrestricted financial support and via membership in the Industry Liaison Subcommittee. Industry Liaison Subcommittee members were encouraged to seek constructive feedback from key individuals in their companies on all the Subcommittee draft reports and submit critiques for consideration by the individual Subcommittees. Feedback was carefully considered by the Subcommittees and the reports refined as deemed appropriate. In this way, the Workshop process gained from the collective experience and background knowledge offered by the sponsoring companies, which further promoted consensus in the Workshop conclusions and recommendations.

Dedication

This *TFOS Lifestyle Workshop* report is dedicated to the late Dr. Juan Carlos Abad (1964-2022) (Department of Ophthalmology, Antioquia Ophthalmology Clinic-Clofan, Medellin, Antioquia, Colombia), in recognition of his outstanding scientific contributions to the fields of the ocular surface, tear film and keratoprosthesis. Juan Carlos, who served on the Societal Challenges Subcommittee, was a visionary, a TFOS Ambassador, and an extraordinary clinician.

Disclosures

Jennifer P. Craig: Adelphi Values Ltd (R), Alcon (F,R,C), Asta Supreme (R), Azura Ophthalmics (F,R), E-Swin (F,R), Johnson & Johnson Vision (R), Manuka Health NZ (F), Medmont International (R), Novoxel (R), Oculeve (F), Photon Therapeutics (R), Resono Ophthalmic (F,R), TFOS (S), Théa Laboratories (F,R), Topcon (F,R), TRG Natural Pharmaceuticals (F,R).

Monica Alves: FAPESP (F), FAEPEX (F), Alcon (F,C), Allergan (F,C), Latinofarma (F,C), Uniaoquimica (F)

Laura E. Downie: Alcon (F), Azura Ophthalmics (F), BCLA (R), CooperVision (F), Cornea and Contact Lens Society of Australia (R), Medmont International (R), NHMRC Australia (F), Novartis (F), TFOS (S)

Nathan Efron: Clinical & Experimental Optometry (S), CooperVision (R), Elsevier (R)

Anat Galor: AstraZenica (C), Dompé (C), EyeCool (C), Novaliq (C), Novartis (C), Oyster Point Pharma (C), Tarsus (C)

José Alvaro Pereira Gomes: Alcon (C,F,R), Allergan/Abbvie (R), Bausch + Lomb (C), CAPES (F), Cnpq (F), FAPESP (F), Johnson & Johnson Vision (C,R), Latinofarma/Cristália (C,R), Novartis (C), Ofta Vision Health/EMS (C,R), Ophthalmos (C)

Lyndon Jones: Alcon (F,C,R), Azura Ophthalmics (F), Bausch + Lomb (F), CooperVision (F,C,R), Essilor (F), Hoya (F), I-Med Pharma (F), ISCLR (S), Johnson & Johnson Vision (F,C,R), Menicon (F,R), Novartis (F), Ophtecs (F,C,R), Ote Pharma (F), Santen (F), SightGlass (F), SightSage (F), TFOS (S), Topcon (F), Visioneering (F)

Maria Markoulli: Alcon (C,F,R), Bausch + Lomb (R), CooperVision (F), CSL Sequiris (R)

Fiona Stapleton: Alcon (C,F), Allergan (F), ANZ Childhood Myopia Group (S), Azura Ophthalmics (F), Brien Holden Foundation (S), Coopervision (C,R), CSL Seqirus (C,R), Exonate (F), Future Vision Foundation (S), ISLCR (S), Menicon (F,R), nthalmic (F), Novartis (C,F), Sun Pharmaceuticals (C)

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(C), Dompé (C,R), Essiri Labs (I), Eyebiotech Limited (C), Johnson & Johnson Vision (C,R), Kala (C,R), Novaliq (C), Novartis (C), Oculis (C), Olivio & Co. (C), Oyster Point (C), Quidel (C), Sight Sciences (C), Sun Pharma (C), Tarsus (C), TearLab/Trukera Medical (C), Versea (C), Visionology (C,I)

Amy Gallant Sullivan: TFOS Executive Director (S), Essiri Labs (I), Lμbris BioPharma (I)

David A. Sullivan: Essiri Labs (PFI), Lμbris BioPharma (PFI, P), TFOS (S)

Mark D. P. Willcox: American Society for Microbiology (S), ISCLR (S), Lumicare Pty Ltd (C), Modulation (F), MUVi (F), Ophtecs (C, F, R), San Air (F), TFOS (S), Whiteley Corp (F)

James S. Wolffsohn: 3m (F), AOS (C), Aston Vision Sciences (S), Atia Vision (C), Bausch + Lomb (C), Alcon (C,F), Allergan (F), CooperVision (C,F), CSIDryEye (C), DopaVision (C), Eyoto (S,P), Johnson & Johnson Vision (F), Rayner (F), M2C Pharmaceuticals (C,F), Medmont (C), Novartis (C,F), NuVision (C,F), Santen (C), Scope Ophthalmics (C, F), SightGlass (F,C), TFOS (S), Théa Laboratories (C,F), Topcon (F), The Eye Doctor (F), Veluon (F), Wolffsohn Research Limited (S)

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