Successful Abstract Submission Guidelines

Abstracts are limited to 2500 characters and spaces for title, abstract body and image caption(s). Therefore, it is important to plan, review and edit your abstract submission for clarity and concision.

- The following general guidelines are intended to aid authors in developing their abstract content.
- A successful abstract should follow the scientific principles and clearly describe the scientific approach and results.
- It is important to note that variability of quality abstract content exists depending on the type of scientific study (eg., exploratory or clinical), the scientific section and the goal of the science.
- While no abstract is likely to include all criteria for an outstanding abstract, some examples of top-scoring abstracts from different scientific sections are provided below for your reference.

Abstract submission is structured with the following body parts:

Purpose
The stated purpose should be concise; usually in no more than 3 sentences. Avoid a long discussion regarding background. Acronyms or abbreviations must be defined.

- The first sentence provides brief background of the area and gap in knowledge.
  - *Example: "Controversy exists regarding the safety of agents that inhibit vascular endothelial growth factor (VEGF) in retinopathy of prematurity (ROP)."*
- The second sentence gives a concise goal of the study. It can be to test a hypothesis, explore an area of inquiry or compare observations to controls.
  - *Preclinical example: We tested the hypothesis that inhibition of VEGF would slow weight gain in newborns **using an experimental model of oxygen-induced retinopathy**.*
  - *Clinical example: We performed a **retrospective, observational clinical study** to learn about changes in the macular structure and visual function in a long-term cohort designed to study the role of anti-oxidants supplements in age- related macular degeneration.*
- The type of research study should be clearly stated as shown in the bolded text in the above examples.

Methods
Methods should include clear, succinct descriptions of what was done or experiments performed and should include the controls for experimental conditions.

- The following information may be included, but is not essential in all cases.
  - Species under study
  - Age and sex of animals/subjects
  - Number of experiments/participants
  - Statistical analysis procedures
  - Inclusion/exclusion criteria
  - Outcome measure
  - Data analysis procedures

Results
Results should be quantitative data with proper statistical information such as standard deviation (SD), standard error of mean (SEM), n- and p-values.

- Figures or tables can be included.
- If a hypothesis is stated in the Purpose, the Results should address the hypothesis.

Conclusions
A concise conclusion based on the evidence presented in the Results section should be provided.

- Do not overstate the results.
- The Conclusions should address the question/hypothesis stated in the Purpose section.

Sphingosine-1-Phosphate (S1P) decreases outflow facility by reducing effective filtration area for aqueous humor outflow in bovine eyes

SECTION: Physiology/Pharmacology

Purpose: The cause of decreased aqueous outflow facility (C) in the conventional outflow pathway of primary open-angle glaucoma remains unknown. Sphingosine-1-phosphate (S1P), a lysophospholipid, was previously reported to decrease C in perfused porcine and human eyes. However, the morphological correlations to this decrease remain unclear. We hypothesize that decreased C by S1P is due to a decrease in effective filtration area (EFA), which results from increased connectivity between the juxtacanalicular connective tissue (JCT) and inner wall (IW) of aqueous plexus (AP) in bovine eyes.
Methods: Freshly enucleated bovine eyes were perfused at 15mmHg to establish a stable baseline C. One eye of each pair (N=7) was then perfused with 5μM S1P and the contralateral eye with GPBS for 2 hours. All eyes were perfused with a fixed volume of fluorescent microspheres (0.002%, 0.5μm) to trace the outflow pattern. Eyes were perfusion-fixed. Trabecular meshwork of eyes (N=4) were frontally sectioned for confocal microscopy. Total length (TL) and filtration length (FL) of AP were measured to calculate percent effective filtration length (PEFL=FL/TL). The tissue was further processed for light microscopy. JCT/IW separation (SL) was measured and calculated for percent separation length (PSL=SL/TL). Two-tailed Student's t-test was used for statistical analysis.
Results: C was significantly increased in both S1P ($p=0.04$) and control ($p=0.002$) groups compared to baseline. Although both groups exhibited washout effect, C was significantly lower in the S1P group (1.93±0.44μl/min/mmHg) compared to the control group (3.60±1.07μl/min/mmHg, $p=0.005$). A significantly lesser amount of tracer was observed along the JCT/IW region of S1P treated eyes, corresponding to a 62.63% decrease in PEFL compared to controls ($p=0.001$). A significant positive correlation was found between PEFL and the percent increase in C. Interestingly, no significant difference was found in PSL between the control (25.64±6.32%) and S1P (22.57±3.34%) groups.
Conclusions: Our results are consistent with our hypothesis that decreased C by S1P is due to a significant decrease in EFA in bovine eyes. However, the morphologic correlation was not related to increased connectivity between the JCT and IW. Further morphologic examination will be needed to understand what structural changes account for decreased EFA by S1P.

Elevated ocular A2E and bis-retinoid levels in a rat model of Smith-Lemli-Opitz syndrome

SECTION: Retinal Cell Biology

Purpose: We previously showed that the retinal pigment epithelium (RPE) in the AY9944-induced rat model of Smith-Lemli-Opitz syndrome (SLOS) exhibits marked accumulation of phagosomes and other lipid/membrane inclusions, compared to age-matched control rats. We hypothesized that the RPE in this model would contain substantially elevated amounts of A2E and other bis-retinoids, relative to controls, which might contribute to the observed pathology. We tested this hypothesis in the present study.
Methods: Sprague-Dawley rats were treated with AY9944 to generate the SLOS rat model, as previously described (Fliesler et al., Arch Ophthalmol. 2004); age-matched rats without AY9944 treatment served as controls. At ca. 10-11 wks postnatal, rat were euthanized and eyes (N=4 per group/treatment) were harvested: for biochemical analysis, eyes were flash frozen in liquid

nitrogen and stored at -80oC, while for histological analysis eyes were formalin-fixed and stored at 4oC. Analysis of A2E and related bis-retinoids as well as all-trans retinal was performed by HPLC as previously described (Sparrow et al., Methods Molec Biol., 2010). Formalin-fixed, OCT-embedded eyes were cryosectioned, and frozen sections were mounted/coverslipped without staining; RPE autofluorescence was assessed by confocal scanning laser fluorescence microscopy, using 488 nm excitation and 500-600 nm emission.
Results: Compared to controls, SLOS rat eyes exhibited the following foldchange increases ($p<0.05$): A2E, 1.52; isoA2E, 2.20; total A2Es, 1.71; all-trans retinal, 1.57. RPE cells in SLOS rat eyes also contained increased numbers of punctate, hyperfluorescent inclusions, compared to age-matched controls, consistent in size and distribution with phagosomes derived from ingested rod outer segment tips.
Conclusions: RPE cells in the SLOS rat model contain elevated levels of A2E and related bis-retinoids, consistent with the observed increase in their phagosome content, compared to untreated controls. These changes may contribute to the retinal dysfunction and degeneration observed in the AY9944-induced SLOS rat model.

Targeting aging: Geroprotective drug metformin reduces risk of adult-onset open-angle glaucoma

SECTION: Glaucoma

Purpose: Caloric-restriction (CR) and CR-mimetic drugs have geroprotective effects that delay or reduce some risks of aging. This study tested the hypothesis that the CR-mimetic drug metformin can reduce the risk of developing the late-onset trait open-angle glaucoma (OAG).
Methods: We analyzed nine years of longitudinal data from a large US health claims database (2001-2009). Diabetics, aged 40 and above with no pre-existing OAG, were monitored for incident OAG. The key predictor was exposure to metformin. A Cox proportional hazard model tested the effect of metformin on the hazard of developing OAG, adjusting for sociodemographic factors, glycemic control (HbA1c level), other diabetes medications, and other ocular and systemic conditions. The University of Michigan Institutional Review Board deemed use of this anonymized database to be exempt.
Results: Of 150,016 diabetics, 5,893 (3.9%) developed incident OAG. Use of >1,110 cumulative grams of metformin over two years was associated with a 25% reduction in relative risk of developing OAG (HR=0.75; 95% CI=0.59-0.95; p=0.017) compared with no metformin use. Every 1 gram increase in metformin was associated with a 0.01% reduced hazard of developing OAG (p=0.001). Thus someone receiving a normal dose of metformin (2 grams per day) over two years would show a 13% reduction in absolute risk of OAG relative to someone not taking metformin. When we stratified by baseline OAG risk and HbA1c level, the greatest absolute metformin-induced risk reduction was seen for those with the highest baseline risk and the highest HbA1c levels. Although HbA1c levels were associated with increased risk of OAG (HR=1.08; 95% CI=1.03-1.13; p=0.003), other hypoglycemic drugs did not reduce risk of OAG, and OAG risk-reduction in response to metformin occurred when HbA1c levels were taken into account.
Conclusions: Metformin use was associated with reduced risk of OAG. This OAG risk reduction was dose-dependent and independent of glycemic control; other diabetes medications did not confer a similar risk reduction. Thus, systems beyond glycemic control, such as neurogenesis, longevity pathways, and/or reduced inflammation may be involved in metformin-induced OAG risk-reduction. If confirmed by prospective clinical trials, these findings would offer novel treatments for this sight-threatening disease and perhaps other diseases of aging too.