Letters to the Editor

MicroRNAs as potential biomarkers of eye diseases

Los miRNAs como potenciales biomarcadores de las enfermedades oculares

Dear Editor:

As authors, we would like to express our gratitude for the encouraging feedback received after the publication of our editorial “Present and Future of RNA Interference”, recently published in Arch Soc Esp Oftalmol. 2015;90:1–3.1

We agree with the statement that the concept of “one gene, one protein”, regarded until a few years ago as one of the main principles of genetics, has been superseded by new discoveries on DNA transcription and translation processes and a greater knowledge of protein synthesis mechanisms.

We also agree with the authors of said letter which states that, since its beginnings in the United States Energy Department in 1980, the Human Genome Project was characterized by an exaggerated optimism and numerous conflicts between the main 18 participating countries. Even so, it made an excellent contribution to the knowledge of genetics and produced unique developments such as the powerful DNA sequencing platforms or a new technique for modifying and genomes. The latter technique could bring within our reach the possibility of rewriting the human genetic code, both in unhealthy as well as healthy cells. This genome modification method, known as clustered regularly interspaced short palindromic repeats (CRISP) could be used for healing genetic diseases in the germinal line not only in the patient but in his children and future descendents.2

Coming back to the new expectations derived from ARN interference, we also agree with the 6 points of said letter outlining the disadvantages of ARN genetic inhibition. However, we would like to defend the possibility of utilizing extracellular miRNAs as biomarkers to identify risks of exhibiting an ocular disease or continuing its course. It has already been demonstrated that miRNAs can be utilized for diagnosing bladder cancer with 75% sensitivity and 85% specificity according to the first trials. This would avoid invasive or semi-invasive tests such as cytoscopy.3 Other studies indicate that miRNAs could also be used as biomarkers for other pathologies, including cardiovascular diseases or Alzheimer. We know that miRNAs remain stable in many fluids and the sequences of most miRNAs are preserved, even between different species. An additional advantage of miRNAs when utilized as biomarkers is that their expression is highly specific for tissue and for this reason they are good indicators of the physiological or pathological condition of a patient. In addition, the level of expression of miRNAs can be assessed through various methods, including the polymerase chain reaction. Accordingly, finding the differential miRNA expression profile in infectious, neurodegenerative, parasitic and cancer pathologies is already a reality4 which cannot go unnoticed to researchers in ophthalmology and science of vision.

One of the main challenges when addressing visual dysfunctions and blindness caused by the most prevalent ocular diseases (glaucoma, macular degeneration, diabetic retinopathy) is to find a minimally invasive, sensitive and specific biomarker that will facilitate the early identification of these diseases, including patient follow-up and response to treatment. Our research group was able to define the differential profile of miRNA expression in tears of diabetic patients with and without retinopathy.5 We are encountering very interesting but relatively nonspecific and limited data and carrying out tests with next-generation sequencing systems to characterize the miRNAs most likely to present retinopathy, exhibit the main pathogenic mechanisms (inflammation, apoptosis, angiogenesis) in addition to the main risk factors in order to discover new biomarkers based on miRNAs for diabetic

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retinopathy on the basis of biological samples which are relatively easy to obtain, preserve and process.

To finish, we would like to thank once more the authors of the letter to the editor for their kind contribution.

REFERENCES


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Dear Editor:

The presence of embryonyal remains of ocular vascular development is infrequent although it can give rise to doubts in diagnostic procedures because said remains could generate opacity, or in the presence of some diseases such as optic neuropathy, papiledema or conditions derived from potential complications such as hemovitreous or retina detachment.¹⁻³

During embryo development, the embryonyal hyaloid artery (EHA)—a branch of the primitive dorsal ophthalmic artery—allows the vascularization of the ocular globe. Said EHA progressively regresses after the 10th week of gestation and disappears entirely at birth.¹ However, some patients can exhibit remains of this artery and related signs.

Incomplete regression of the fetal vascular system is known as persistence of primary hyperplasic vitreous, although at present “fetal vasculature persistence” (FVP) is preferred. This is an infrequent congenital anomaly of unknown cause, which is unilateral in 90% of cases and can be anatomically classified depending on the persistence of

the anterior, intermediate or posterior section of said fetal vasculature. This incomplete reabsorption can express as vestiges of the EHA—adhered to the posterior lens capsule or in the papilla—or as a fibrovascular membrane which could alter intraocular and retinal development as well as ciliary processes with severe complications and visual compromise. Structures such as Cloquet’s canal² or stilling’s duct,² the Mitten-dorf dot³ or Bergmeister’s papilla⁴ are different structures that can be found in this range of intraocular embryonyal vascular development. The severest forms express with leukocoria and microphthalmos, requiring differential diagnostic with retinoblastoma, retrolental fibroplasia or Coats disease, among other processes.

The case described herein is a 45-year-old patient who visited the ophthalmology practice for a routine checkup, without referring diminished vision or any other visual or ocular symptom. The patient did not refer any personal or familial history of interest or any known allergy to drugs. Examination revealed a visual acuity of one in both eyes (BE), with normal biomicroscopy and intraocular pressure in BE.

Cloquet’s canal (II)☆

Canal de Cloquet (II)