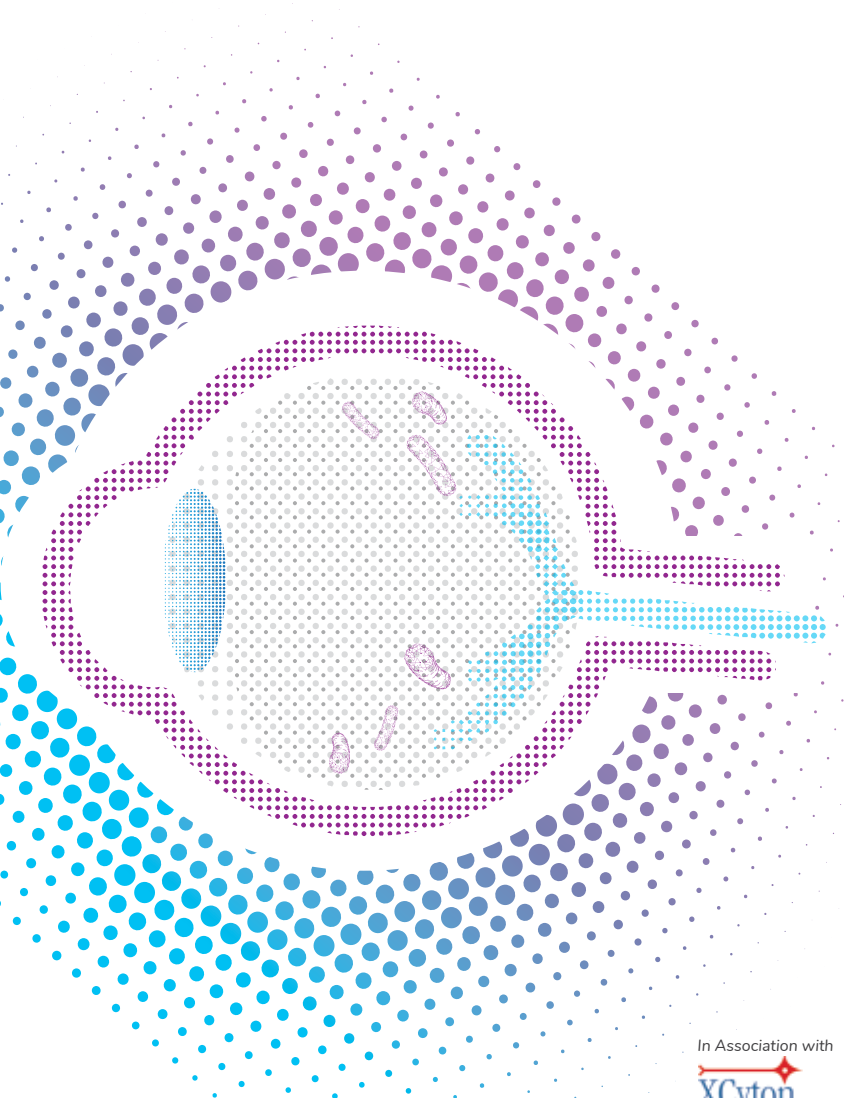


# Syndrome Evaluation System (SES) for **Eye infections**



In Association with



# Prevalance

- According to WHO, 1 in 10 patients get infection while receiving care globally<sup>[1]</sup>
- The burden of HAI (healthcare associated infection) is several fold higher in low- and middle-income countries than in high-income ones
- Globally, more than 50% of surgical site infections can be antibiotic resistant<sup>[1]</sup>. In low-and middle-income countries, 11% of patients who undergo surgery are infected in the process<sup>[3]</sup>

# Molecular Basis of diagnosis of infectious diseases<sup>[4]</sup>

Molecular detection by amplification and hybridization of nucleic acids as a technology has opened a new and innovative era for microbial diagnosis. The use of nucleic acid detection for the diagnosis of infectious diseases in clinical laboratories is facilitated by PCR (Polymerase Chain Reaction), This approach is useful to detect mutations associated to drug resistance directly on biological samples without the requirement of culturing organism.

# Syndrome Evaluation System (SES)

A patented technology that comprises of rapid multiplex amplification and accurate identification of the virulence associated genes of the causative agents or organisms. This amazingly fast and accurate platform transcends all conventional diagnostic tests and helpful when organisms are difficult to cultivate or difficult to find. The technologies currently available for diagnosis of infections are grossly inadequate to detect early during the illness and to institute specific therapy in critical illnesses, resulting in loss of function or even loss of life.

The amplification of the gene allows for higher sensitivity of the test and the re-naturation of the amplified signature gene to its chemically identified complementary gene sequence on the SES allows for higher specificity of the test. And the simultaneous detection of multiple pathogens allows for early diagnosis of the infection and initiation of therapy.

# The SES Advantage

Rapid	Sample to report in 7 - 10 hours
Higher Accuracy	Detects more number of cases than conventional methods ( 75% by SES vs 10-15% conventional method)
Cost effectives	Avoids multiple testing and unnecessary investigations and reduces ICU stay & associated cost.
Provides Direct evidence for the presence of infection	Detects DNA of pathogens
Comprehensive	Detects fungi, viruses, parasites and bacteria in a single test. It also detects uni-microbial or poly-microbial infections.
Rules in or Rules out infections	

# Eye Infections

Eye infections occur when harmful microorganisms — bacteria, fungi and viruses — invade any part of the eyeball or surrounding area. This includes the clear front surface of the eye (cornea) and the thin, moist membrane lining the eye ball and inner surface of eyelids (conjunctiva).

## Endophthalmitis

Endophthalmitis is an inflammatory condition of the intraocular cavities (i.e., the aqueous and/or vitreous humor), usually caused by infection. Postoperative endophthalmitis following cataract surgery is a dreaded complication. Fortunately, the incidence has declined in recent times after changes in surgical techniques, sterilization procedures, and better understanding of the risk factors<sup>[12]</sup>. The global reported incidence of post cataract endophthalmitis ranges from 0.02% to 0.26%<sup>[12]</sup>.

## Uveitis

Uveitis refers generally to a range of conditions that cause inflammation of the middle layer of the eye, the uvea, and surrounding tissues due to a viral or a bacterial infection. The average annual incidence of uveitis has been reported to be around 14-17 per 100,000. The total population prevalence of uveitis varies geographically and has been roughly estimated to be around 38 per 100,000 in France, 200 per 100,000 in the US, and 730 per 100,000 in India<sup>[13]</sup>.

## Retinitis

Infectious retinitis is an inflammation of the retina resulting from infection by viruses, bacteria, fungi, or parasites. These pathogens affect patients differently depending on characteristics like age, location, and immune status.

### SES-Traumatic/ Chronic/ Endogenous Endophthalmitis

Microbe Type	Microorganism	Microbe Type	Microorganism
Gram Positive Bacteria	<i>Staphylococcus aureus</i> <i>Streptococcus pneumoniae</i> Group B <i>Streptococcus</i> <i>Enterococcus spp</i> <i>Streptococcus pyogenes</i> Coagulase Negative <i>Staphylococcus</i> <i>Propionibacterium acnes</i>	Gram Negative Bacteria	<i>Pseudomonas aeruginosa</i> <i>Acinetobacter baumannii</i> <i>Leptospira pathogenic spp.</i> <i>Haemophilus influenzae</i> <i>Neisseria meningitidis</i> <i>Escherichia coli</i> <i>Klebsiella pneumoniae</i> <i>Enterobacter aerogenes</i> <i>Proteus mirabilis</i> <i>Salmonella spp.</i> <i>Bacteroides fragilis</i>
Fungi	<i>Aspergillus spp.</i> <i>Candida spp.</i> <i>Fusarium spp.</i>	Sample Type : Aqueous Humor/ Vitreous Aspirate	

## SES-Pan Uveitis

Microbe Type	Microorganism
Atypical Bacteria	<i>Mycobacterium tuberculosis</i> <i>Mycobacterium chelonae</i> <i>Mycobacterium fortuitum</i>
Viruses	Herpes Simplex Virus 1&2 Cytomegalovirus Varicella Zoster Virus Chikungunya Rubella Dengue
Parasites	<i>Toxoplasma gondii</i>
Sample Type : Aqueous Humor/ Vitreous Aspirate	

## SES-Uveitis

Microbe Type	Microorganism
Atypical Bacteria	<i>Mycobacterium tuberculosis</i> <i>Mycobacterium chelonae</i> <i>Mycobacterium fortuitum</i>
Parasites	<i>Toxoplasma gondii</i>
Sample Type : Aqueous Humor/ Vitreous Aspirate	

## SES-Fuch's

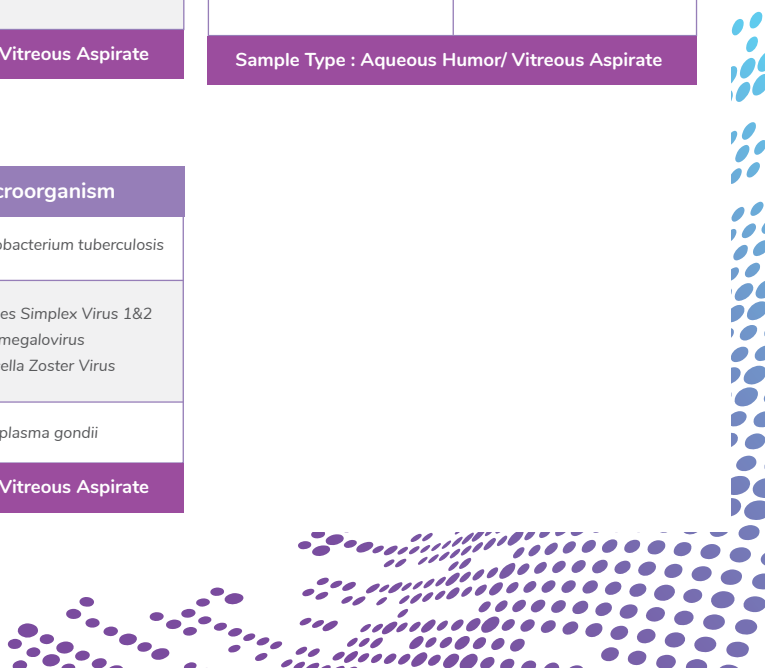
Microbe Type	Microorganism
Atypical Bacteria	<i>Mycobacterium tuberculosis</i>
Viruses	Herpes Simplex Virus 1&2 Cytomegalovirus Varicella Zoster Virus
Parasites	<i>Toxoplasma gondii</i>
Sample Type : Aqueous Humor/ Vitreous Aspirate	

## SES-Viral Retinitis

Microbe Type	Microorganism
Viruses	Herpes Simplex Virus 1&2 Cytomegalovirus Varicella Zoster Virus
Sample Type : Aqueous Humor/ Vitreous Aspirate	

## SES-Post Surgical Endophthalmitis

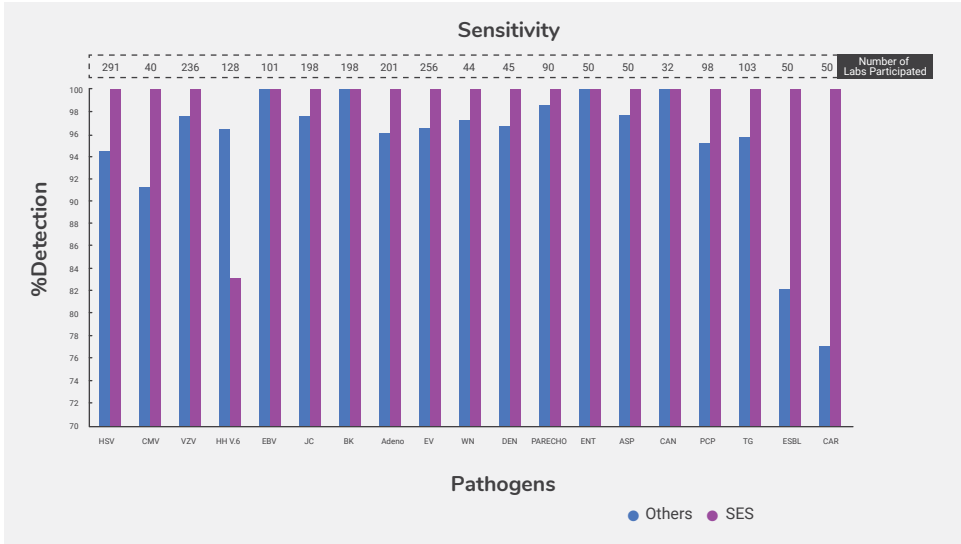
Microbe Type	Microorganism
Gram Positive Bacteria	<i>Staphylococcus aureus</i> Group B <i>Streptococcus</i> <i>Enterococcus</i> spp Coagulase Negative <i>Staphylococcus</i> <i>Propionibacterium acnes</i>
Gram Negative Bacteria	<i>Pseudomonas aeruginosa</i> <i>Haemophilus influenzae</i> <i>Escherichia coli</i> <i>Klebsiella pneumoniae</i> <i>Enterobacter aerogenes</i>
Fungi	<i>Aspergillus</i> spp. <i>Candida</i> spp. <i>Fusarium</i> spp.
Sample Type : Aqueous Humor/ Vitreous Aspirate	



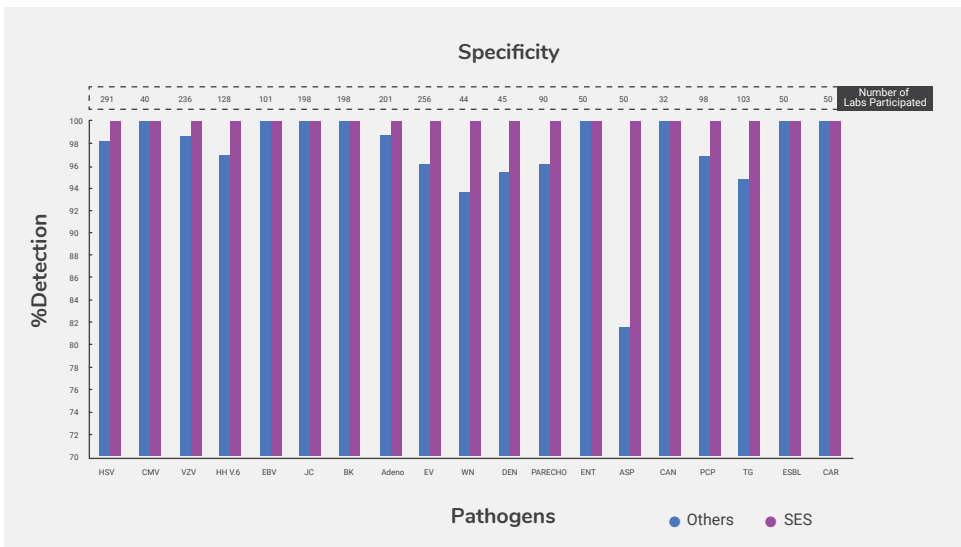
# Performance of SES Testing-Quality Considerations

The SES test scored exceptionally in International Proficiency Test conducted by Quality Control for Molecular Diagnostics (QCMD), an independent International External Quality Assessment (EQA) / Proficiency Testing (PT) organisation

## 1. International Proficiency Testing- SES sensitivity

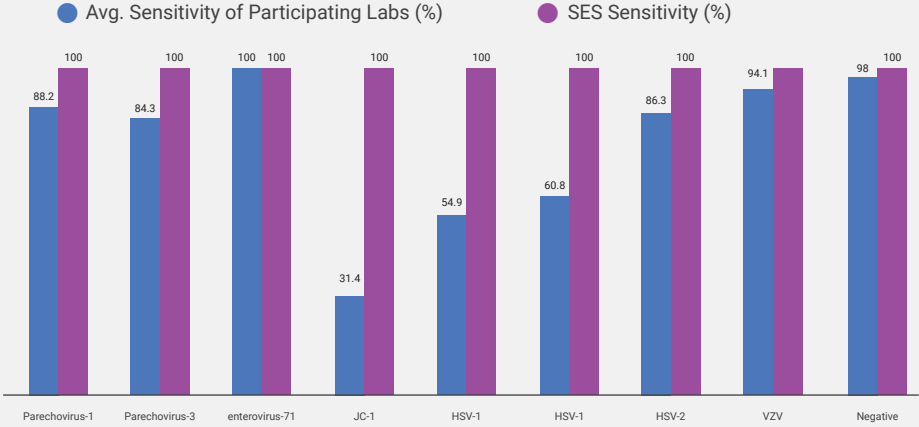


## 2. International Proficiency Testing- SES specificity

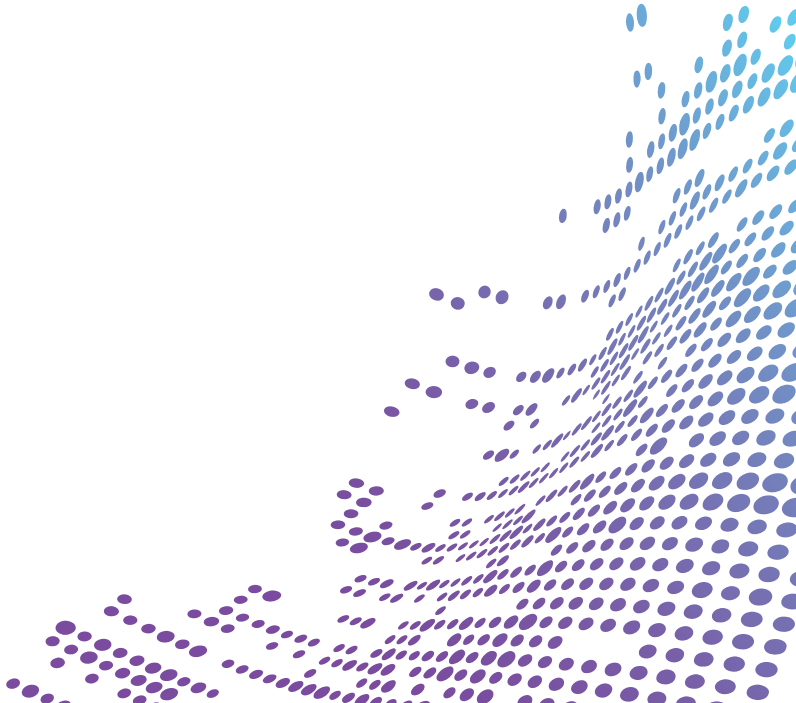


### 3. Validation for SES Viral Panel Pathogens

51 Participating labs | 17 Countries | 10 Clinical samples



**SES Test shows 100% Concordance**



# Sample Requirements:

## Sample Type

Aqueous Humor/ Vitreous Aspirate

## Other Sample Type

Other Sample Types- Vitreous lavage/ or any other eye specimen

## Volume

100 µL

## Acceptance Criteria of Sample

- Freshly collected Eye Fluid samples
- Samples volume greater 100 µL
- Sample collected only in 1ml insulin syringe

## Rejection Criteria of Sample

- Eye sample /other eye fluids stored for more than 24 hours
- Sample collected in in-house sterilised vials
- Samples transferred/ aliquoted from tube to the other

## Precaution during sampling

- Sterilise the collection site to prevent skin / eye lashes contaminants getting into the sample

# References

1. <https://www.who.int/infection-prevention/en/>
2. [https://www.who.int/infection-prevention/publications/burden\\_hcai/en/](https://www.who.int/infection-prevention/publications/burden_hcai/en/)
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13. <https://www.chanrejournals.com/index.php/indiainflam/article/view/249/html>

## Micra by MedGenome offers advanced test for genetic and molecular testing in infectious diseases

