

# Use of 16S Panbacterial Polymerase Chain Reaction of Aqueous Humor for Diagnosis of an Unusual Bacterial Sclerokeratitis From an Undescribed Member of the Family *Flavobacteriaceae*

Redion Petrela BA, Robert Swan MD

SUNY Upstate Medical University, Syracuse New York

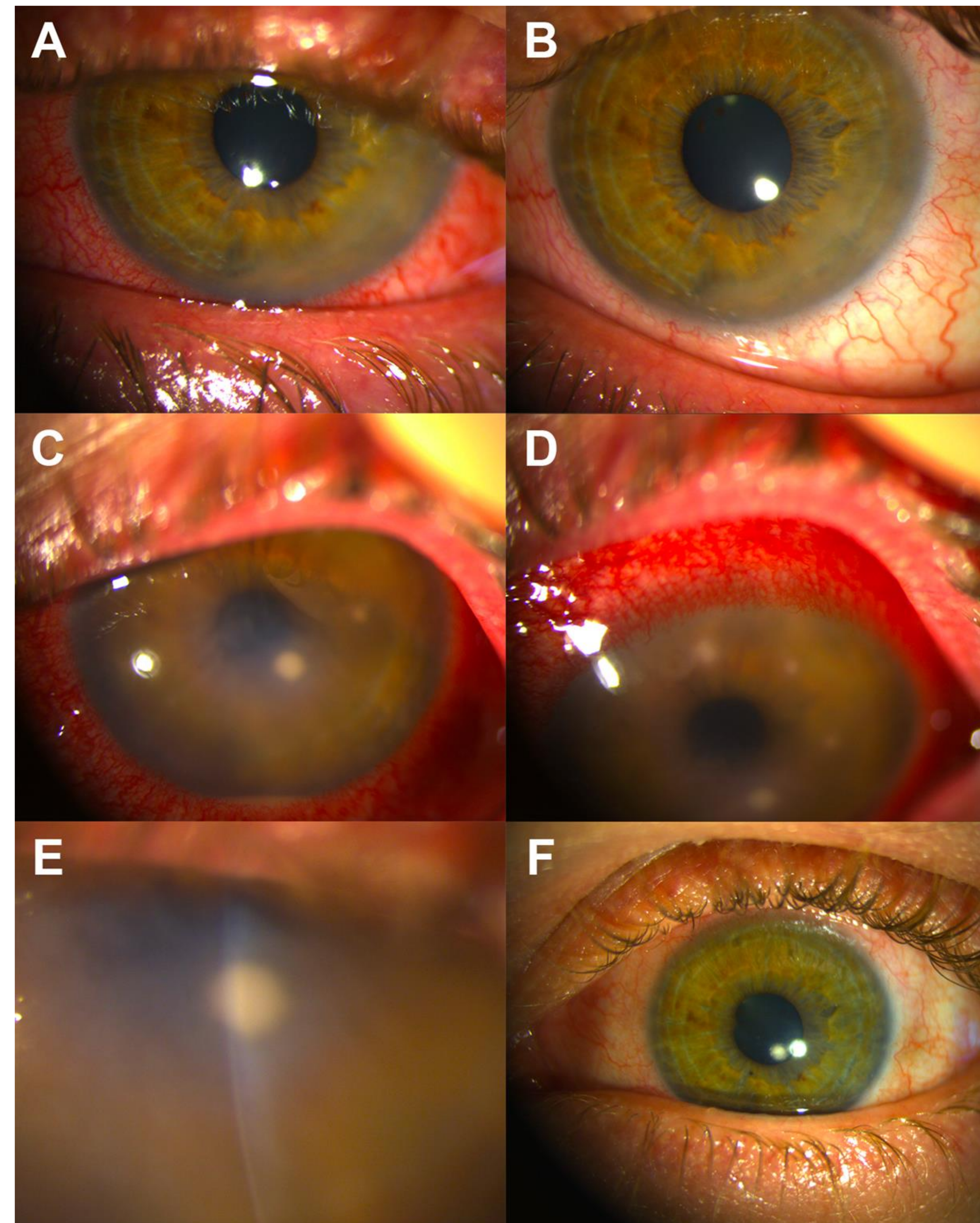


## Introduction

The family *Flavobacteriaceae* are Gram-negative bacilli that rarely cause infection in humans. *Capnocytophaga*, *Chryseobacterium*, and *Elizabethkingia* are genera that have been reported to cause keratitis<sup>1,2</sup>. These bacteria usually cause an aggressive keratitis<sup>3,4,5</sup>, but we report an unexpectedly indolent course caused by a previously undiscovered species belonging to the same family.

## Case Presentation

- Healthy 29-year-old male with two-week history of foreign body sensation, scleral injection, and photophobia of the left eye.
- Presenting VA was 20/150. Initially considered non-infectious, treated with polytrim drops and later oral prednisone.
- Clinical picture then resembled a viral keratitis, but was only partially responsive oral acyclovir
- Later received subconjunctival triamcinolone injection, infection worsened, and then resembled a fungal sclerokeratitis
- 16S rRNA PCR of the aqueous fluid identified a previously unknown member belonging to *Flavobacteriaceae* bacterial family.
- The laboratory was unable to further identify the organism using public databases.
- Culture of anterior chamber fluid showed no growth.
- Started on empiric therapy against gram negative bacilli including ceftazidime intravitreal injection, oral trimethoprim/sulfamethoxazole, topical amikacin, and topical polymyxin B/trimethoprim
- Slow improvement over the next three months
- He received antibiotics for seven months with complete resolution of symptoms and final visual acuity 20/30.



**Figure 1:** Sclerokeratitis caused by an undescribed species of the *Flavobacteriaceae* family. **A)** 2.5 months after onset with scleral injection and inferotemporal thickening of the cornea. **B)** Incomplete blanching after phenylephrine 2.5% drops. **C & D)** Sclerokeratitis 6 weeks after subconjunctival triamcinolone injection (2mg in each quadrant). **E)** High magnification of mid-stromal lesion. **F)** Partial improvement 3 months after initiation of antibiotic therapy.

## Discussion

We report a case of bacterial keratitis caused by an unknown species for which the diagnosis was made using 16S rRNA PCR. Since we were not able to identify the genus and species, there was no precedence for how to treat this infection. Since we were unable to culture the bacteria, antibiotic susceptibility testing could not be performed. We conducted a review of the literature and found two case reports showing improvement with TMP/SMX in a similar sounding genus, *Flavobacterium*, which is an old naming convention for species belonging to the genera now called *Chryseobacterium* and *Elizabethkingia*<sup>6,7</sup>. We used these case reports to develop an empiric treatment against this gram-negative bacilli which was effective in treating our patient.

## Conclusion

Our experience is unique both in the unusually slow clinical evolution, diagnosis through PCR of aqueous humor, and that we knew the family of the bacteria but not the species or sensitivities. As 16S panbacterial PCR testing becomes more accessible and common we anticipate additional PCR-positive, culture-negative scenarios will occur. We provide guidance on an initial empiric treatment regimen for the *Flavobacteriaceae* family – known to be multi-drug resistant.

## References

1. Karsten E, Watson SL, Foster LJ. Diversity of microbial species implicated in keratitis: a review. *Open Ophthalmol J.* 2012;6:110-24. doi:10.2174/1874364101206010110
2. Alexandrakis G, Palma LA, Miller D, Alfonso EC. *Capnocytophaga* keratitis. *Ophthalmology.* Aug 2000;107(8):1503-6. doi:10.1016/s0161-6420(00)00227-x
3. Izaguirre-Anariba DE, Sivapalan V. *Chryseobacterium indologenes*, an Emerging Bacteria: A Case Report and Review of Literature. *Cureus.* Jan 21 2020;12(1):e6720. doi:10.7759/cureus.6720
4. Yang YS, Chun JW, Koh JW. Keratitis with *Elizabethkingia meningoseptica* occurring after contact lens wear: a case report. *Korean J Ophthalmol.* Apr 2013;27(2):133-6. doi:10.3341/kjo.2013.27.2.133
5. Bucci FA, Jr., Holland EJ. *Flavobacterium meningosepticum* keratitis successfully treated with topical trimethoprim-sulfamethoxazole. *Am J Ophthalmol.* Jan 15 1991;111(1):116-8. doi:10.1016/s0002-9394(14)76916-8
6. Ramos-Esteban JC, Bamba S, Jeng BH. Treatment of multidrug-resistant *Flavobacterium indologenes* keratitis with trimethoprim-sulfamethoxazole. *Cornea.* Oct 2008;27(9):1074-6. doi:10.1097/ICO.0b013e318176189e



This study was funded in part by unrestricted grants from Research to Prevent Blindness, Inc. New York, New York and Lions District 20-Y1, Syracuse, New York. No other significant financial interests or relationships to disclosure

SUPPORTED BY  
**Research to  
Prevent  
Blindness**

