The focus shifts to gene therapy in pipeline for microbial keratitis

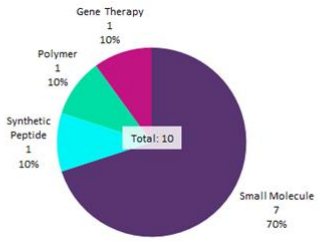
Magdalene Crabbe — Senior Healthcare Analyst, GlobalData

Microbial keratitis is an ocular infection of the cornea. Causative microbial agents include bacteria, viruses, fungi and parasites. Although treatment strategies appear to be straightforward, the growing problem of antibiotic resistance and hypersensitivity reactions to first-line antifungal therapy nantamycin means there are still opportunities for pharmaceutical companies to develop innovative products that can alleviate symptoms and reduce damage to ophthalmic structures.

There are 10 products in the pipeline for microbial keratitis. Eight of these products are at the preclinical stage of development, and the remaining two products are at the discovery stage. While a lack of late-stage pipeline agents would usually signify limited innovation in a particular therapy area, the fact that four molecule types are represented in the pipeline for microbial keratitis shows that pharmaceutical companies are still exploring novel strategies to treat these burdensome infections.

There has been a noticeable shift toward developing more biologics for the treatment of ophthalmic diseases as these targeted therapies tend to have fewer side effects and rapidly bring about therapeutic outcomes.

Figure 1: Global pipeline for microbial keratitis by molecule type, October 2019



The only marketed gene therapy for an ophthalmic condition is Novartis' Luxturna (voretigene neparvovec), which in 2017 became the first FDA approved therapy for inherited retinal diseases such as retinitis pigmentosa and Leber congenital amaurosis. Marked reduction of photophobia and improvement in vision experienced by patients sets gene therapy as a potentially viable strategy to preserve ocular architecture in a situation where degenerative processes would usually lead to photoreceptor death and loss of central vision.

One gene therapy product is at the preclinical stage of development for herpetic keratitis caused by herpes simplex viruses 1 and 2. The drug candidate, which is being developed by US biotech firm Editas Medicine, uses an adeno-associated virus (AAV) delivery system. AAV is an infectious, non-pathogenic micro-organism that introduces a CRISPR-associated protein 9 (Cas9) nuclease and guide RNA molecules to remove latent viral DNA.

Developing effective therapies that increase patient retention rates is an important step toward addressing the unmet needs for these indications, which if left untreated can cause permanent blindness and chronic pain.