Ti3C2Tx in ophthalmic medical device interventions

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The properties of MXenes lend themselves to bioactive medical device applications. One such application is the use of MXenes within devices for the treatment of cataracts, the primary cause of preventable blindness globally. Current treatment replaces the opaque natural lens with a transparent polymer plastic device called an intraocular lens, allowing a return to visual clarity. However, complications occur including loss of accommodative focus and potential complications associated with a poor wound healing response. We have considered the use of Ti3C2Tx as a transparent, conductive, hydrophilic and flexible coating within an accommodative IOL design. Ti3C2Tx facilitated a stimuli responsive shift in accommodative power and repression of an inflammatory and fibrotic response linked to loss of device function over time. Our studies suggest a compatible device which may be further explored for propensity to moderate dysregulated wound healing to resolve, in this example, loss of accommodative focus and reduce complications leading to ophthalmic device failure. These materials may also be used in bioactive lens devices for sensor diagnostics.