Severe eye burns damage the cornea very obviously by causing immediate clouding. Secondary damage by acutely increased intraocular pressure is mostly not detected, but can result in a damaged optic nerve head which then causes visual impairment after optical rehabilitation of the initially damaged cornea. Intraocular pressure spikes have been detected in living animals during acute corneal corrosive injury [1]. Creating a reproducible live-animal-free model poses a first major step in studying and ultimately countering pressure build-up in the intraocular space. For this we employed the Ex Vivo Eye Irritation Test (EVEIT) organ culture model as a platform [2].

Notably different pressure traces were recorded during the exposure with rising concentrations of NaOH. All pressure traces progressed in a similar manner: After a short initial stagnant phase, the pressure increased steeply in the first 30 seconds to their respective maxima and then plateaued or decreased slightly over time (Figure 5). Exposure with higher concentrated NaOH yielded higher pressure spikes (Figure 6).

With this model, we are now able to precisely observe anterior intracameral pressure conditions in a highly resolved manner. Acute pressure changes during chemical corrosive injury can now be quantified in a standardized way and possible interventive measures explored. The EVEIT ocular pressure model – as a live animal free model – will also contribute to the ever expanding field of the 3R method principle.

**References:**
