Selenite cataract, first described in 1978 (Ostadalova et al., 1978), is an experimental model that mimics human senile (age-related) cataract. This was chosen as the experimental animal model for the present study.

1. **Experimental animals**

Nine day-old rat pups (Wistar strain) were used throughout this study. The pups were housed along with parents in large spacious cages, and the parents were given food and water *ad libitum*. The animal room was well-ventilated and had a regular 12:12-h light/dark cycle throughout the experimental period. These animals were used in accordance with Institutional Guidelines and with the Association for Research in Vision and Ophthalmology Statement for the Use of Animals in Research.

For each set of experiments, the rat pups were divided into one control and two experimental groups with 15 pups in each group:

1) Group I, received only saline (normal)
2) Group II, received selenite alone (selenite-challenged, untreated)
3) Group III, received selenite and ellagic acid (selenite-challenged, ellagic acid-treated)

In both experimental Groups (II & III), sodium selenite (19 μmol/kg body weight) was injected subcutaneously on postpartum day 10. In addition, pups in Group III received intraperitoneal injections of ellagic acid (200 mg/kg body weight); the first dose of ellagic acid was administered 1 day prior to the selenite injection (that is, on postpartum day 9), and was repeated once daily for five consecutive days thereafter (on days 10 through 14).
2. **Morphological assessment of cataract**

   The presence of cataract in the rat eyes was assessed by slit-lamp biomicroscopy when the pups first opened their eyes, that is, on the 16\textsuperscript{th} post partum day. Prior to this examination, mydriasis was achieved in each eye by instilling one drop of a topical ophthalmic solution containing tropicamide with phenylephrine (Maxdil Plus, Hi-Care Pharma, Chennai, India) every 30 minutes while keeping the rats in a dark room for 2 hour. The eyes were viewed under a slit-lamp biomicroscope (12X magnification) at different time points according to the experimental conditions. At the final examination, any cataracts that had developed were graded (Hiraoka and Clark, 1995) and photographed. To avoid inter observer variability in grading the extent of cataract formation (if any), only a single individual (a senior ophthalmologist, Dr. M. Rajamohan) performed the slit-lamp examination.

   After the slit-lamp examination, the lenses were dissected out by a posterior approach and taken for further analysis.

3. **Statistical analysis**

   Statistical analyses were performed with the help of COSTAT, SPSS (11.5, Chicago, IL, USA). \( P \) values of \(<0.001\), \(<0.01\), and \(<0.05\) were considered significant. Specific statistical programmes and the level of significance were used per the requirements of the specific experiments performed and are described in each chapter.