

COMPILED AND EDITED BY THE **CONNECT TEAM** BASED ON INPUT FROM THE
FEATURED **RESEARCHERS**

**SATHEES C RAGHAVAN (ASSOCIATE PROFESSOR, DEPARTMENT OF
BIOCHEMISTRY)**



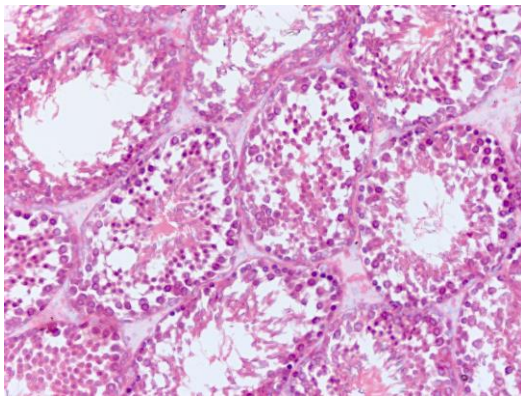
(MANOJ SUDHAKARAN)

Studying dna repair, genomic instability and cancer therapeutics

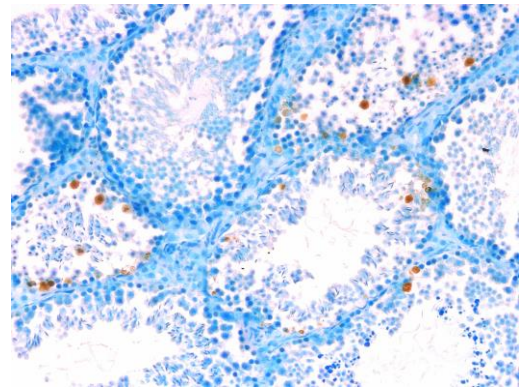
Sathees C Raghavan and his group work in the field of DNA repair, chromosomal translocations, altered DNA forms, the biochemistry of antibody diversity generation and cancer therapeutics. Recently, they have designed, synthesized and identified a novel inhibitor—*SCR7*—of Ligase IV, an enzyme involved in the final sealing of DNA double-strand breaks during NHEJ (a key DNA repair pathway). *SCR7* exhibited anti-tumour activities in most cancers and its usage improves the efficacy of existing cancer therapeutic modalities by bringing down their effective dose. In the past year, this molecule has gained worldwide popularity by helping improve precision and efficiency of genome editing technology.

Another area of research that interests Raghavan's team is how the integrity of the genome is threatened. Among the threats to genome integrity are hazardous environmental factors like pesticides used extensively in agriculture. Pesticides have been known to damage DNA in many ways. Raghavan's team studies a commonly used organochlorine pesticide, endosulfan (ES). The World Health Organization (WHO) speculates that ES, like many other pesticides, can be detrimental to human health. However, little is known about how it causes genotoxicity. Using mouse as a model system, Raghavan and his group have demonstrated that ES exposure affects the physiology and cellular architecture of various organs. They found that it was particularly damaging to mice testes. The testicular damage ES caused was shown to be both qualitative and quantitative in nature. It affected spermatogenesis, reducing quantity and vigour of sperm, thus leading to male infertility. The results of this study also indicate that ES is more detrimental to males than females.

Another area of research that interests Raghavan's team is how the integrity of the genome is threatened. Among the threats to genome integrity are hazardous environmental factors like pesticides used extensively in agriculture



Histological analyses of Endosulfan treated mice testes showing depleted seminiferous tubules (Courtesy: SATHEES RAGHAVAN)



Testicular cell death in Endosulfan treated testes seen as brown spots (Courtesy: SATHEES RAGHAVAN)



Raghavan with his team (MANOJ SUDHAKARAN)