Relevant Concepts – Transgenic organisms & methods

- Transgenic organisms are genetically modified orgnaisms that contain foreign DNA that has been introduced via recombinant DNA methods.
- **Cre recombinase**: a tyrosine recombinase enzyme derived from the P1 bacteriophage that has proven to be a key element in a process known as recombination-mediated cassette exchange (RMCE).
- **RMCE**: procedure in reverse genetics allowing the systematic, repeated modification of higher eukaryotic genomes by targeted integration, based on the features of site-specific recombination processes (SSRs) via clean exchange of preexisting gene cassette for an analogous one carrying the gene of interest.
- **SSRs**: type of genetic recombination in which DNA strand exchange takes place between segments possessing at least a certain degree of sequence homology.

Techniques – LoxP-Stop-LoxP

- LoxP-Stop-LoxP (LSL): a regular plasmid gene expression vector system that utilizes the described cassette to achieve Cre-mediated conditional activation of gene expression in mammalian cells and animals.
- When a transgenic animal carrying LSL is crossed to an animal carrying a tissue-specific Cre transgene, the progeny animals carrying both types of transgenes are activated in cells where the tissue-specific Cre is expressed.
- The authors used this to overcome the barrier that the RIPK3 D161N mutation caused, the barrier being the embryonic lethality, to test the function of the gene in adult mice on their purposed pathway.

Illustration of Techniques