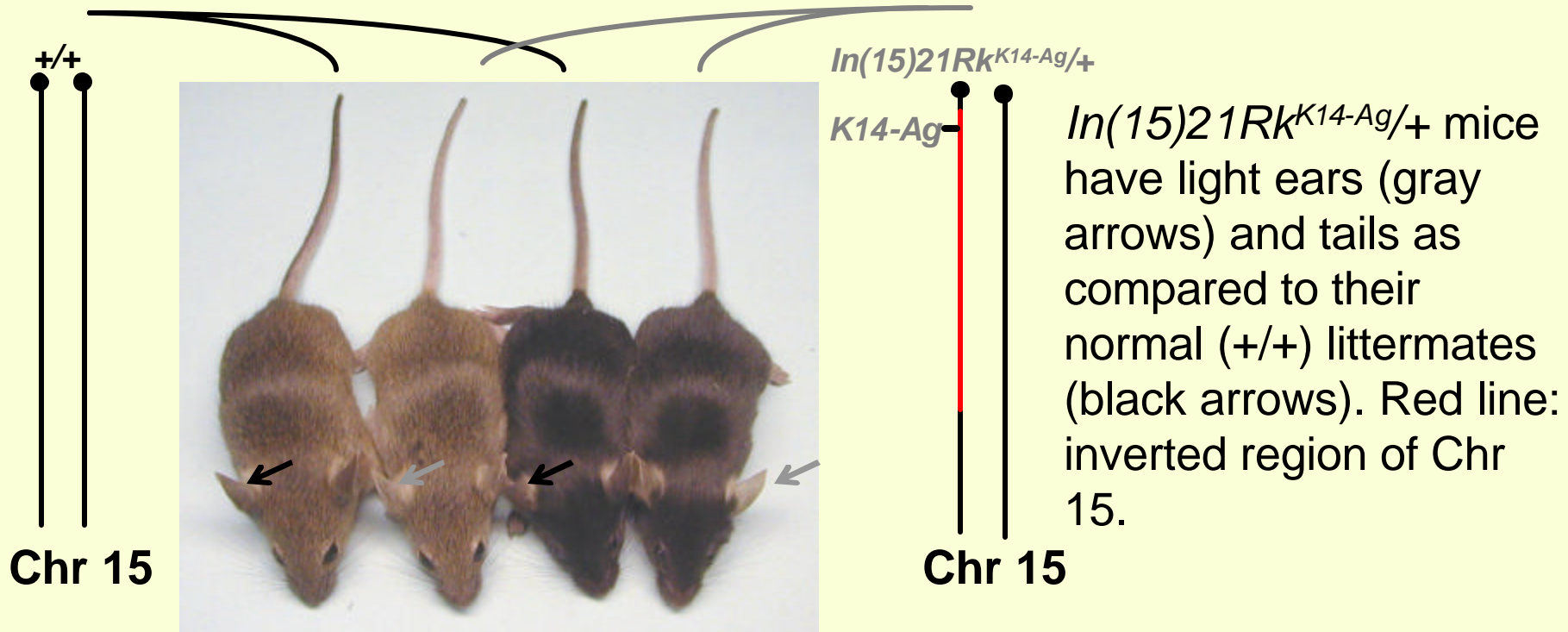


# Chromosome engineering of a mouse reagent for functional-genomics analyses of human Chromosome 5p [Contact: Yun You (youy@ornl.gov); funding source DOE-OBER]

**Purpose:** To modify existing mouse chromosomal inversions so that they may be used for easy recovery and maintenance of all types of mouse mutations

**Accomplishment:** Dr. Wallace Chick (Postdoctoral fellow in Dr. Yun You's laboratory at ORNL) successfully constructed a new inversion reagent for the ORNL human Chromosome 5p functional-genomics effort

- Embryonic stem-cell lines were derived from the known *In(15)21Rk* inversion [ *In(15)21Rk* /+ mice are normal, and *In(15)21Rk* / *In(15)21Rk* mice die prenatally].
- Gene-targeting techniques were used to insert the *K14-Ag gene*, conferring dominant yellow color, into the inverted chromosome in the ES cells.
- *In(15)21Rk*<sup>K14-Ag</sup>/+ mice generated from the targeted ES cells have lighter ears and tails, now allowing the use of this inversion in mutation recovery and maintenance crosses.



- Mice derived from the targeted ES cells manifest an easily visible phenotype, allowing them to be used as a genetic reagent for the mouse genetics community.
- This modified inversion spans the proximal segment of mouse Chr 15, which is homologous to human Chr 5p, a region of the DOE interest.
- This appropriately marked inversion can now be used for easy, low-cost maintenance of detrimental 5p-homologous mutations derived from either gene- or phenotype-driven mutagenesis screens.