Chromatin state affects the DNA breakage/repair mechanism in wheat


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In radiation hybrid (RH) mapping, the double stranded breaks are repaired by either homology-directed repair or non-homologus end-joining

RH induced deletion mapping provides an excellent resource for studying the chromosome structure and its correlation with DNA repair

RH maps have been proposed to provide:
- higher and more uniform resolution than genetic maps
- supposed to be independent of the distribution patterns observed for meiotic recombination

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CONCLUSIONS

- The 3B-RH panel provided on average a 10.5 folds higher resolution than the genetic map, reaching a max of 136-fold better resolution at the centromere.
- The average resolution, calculated as the total physical size of the chromosome divided by the total map length, was 0.53 Mb cR-1 with a maximum of five-fold deviation from this value (0.1 and 1.8 Mb cR-1) along the chromosome. The RH mapping resolution is six times more uniform than genetic mapping resolution.
- The results suggest that RH mapping potentially relies on poised chromatin regions, probably corresponding to the recombination hot-spot observed in genetic mapping.
- The overall high resolution and consistent physical to cR conversion across the entire chromosome makes this approach the most dependable for the scaffold assembly of genome sequencing initiatives.

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