

CONSTRUCTION OF GENE MAP OF HUMAN CHROMOSOME 3 USING RH-MAPPING OF *NotI*-STSs

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The endonuclease *NotI* restriction sites (5'-GCGGCCGC-3') are located in CpG-island, which are associated with 5'-UTR of genes. Therefore STSs (sequenced tagged site), generated to the sequences around *NotI*-sites, might be considered as the universal markers of genes. Libraries of *NotI*-clones of human chromosomes 3 were constructed earlier. In our laboratory, 113 *NotI*-STSs for 84 *NotI*-clones were created. We have determined the physical localizations of 30 *NotI*-STSs by PCR screening of radiation hybrid panel GeneBridge4 and constructed the physical *NotI*-map of human chromosome 3, including 60 *NotI*-STSs. A BLAST homology search was performed for the localized *NotI*-clone genomic sequences against the public databases (GenBank, dbEST, EMBL, TIGR and "Draft Human Genome Database"). Significant homologies with known human genes and/or ESTs were shown for 91,7% *NotI*-clones. Therefore *NotI*-map is the gene map of human chromosome 3. The localization of the majority *NotI*-STSs and corresponding homologous genes and ESTs completely coincided.

The application of the *NotI*-STSs as gene markers allowed detecting physical localizations of eight new nucleotide sequences on human chromosome 3, which have homology with genes, earlier localized on other human chromosomes. We have shown that *RINZF* gene earlier localized on 8q13-q21.1 has the full-length copy on human chromosome 3. Three genes (*LOC132160*, *ATP11B* and *ITGA9*) on chromosome 3, which markers by *NotI*-STSs, have similarity regulatory regions with the genes *KIAA1157* (12q14.1), *HSA9947* (1p36) and *SCYA5* (17q11.2-q12), respectively. Similarity of functions for three pairs of the genes, (*LOC132160* / *KIAA1157*, *ATP11B* / *HSA9947* and *ITGA9* / *SCYA5*), marked by the *NotI*-STSs, was shown. This allowed us to consider *NotI*-STSs as universal gene markers and apply them for the search and localization of new human genes, homologous genes and pseudogenes.