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THE GRAPERESEQ 18K VITIS GENOTYPING CHIP

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Summary. With the aim to develop a 20K genotyping chip for the international community, 43 Vitis vinifera ssp vinifera, 4 V. vinifera ssp sylvestris, 3 V. cinerea, 3 V. berlandieri, 3 V. aestivalis, 3 V. labrusca, 1 V. linceumii, 5 M. rotundifolia genotypes were compared and sequenced using Illumina platforms. An average of 4.3 and 3.4 millions SNP were detected respectively for V. vinifera and other Vitis species genotypes. SNPs were first filtered upon technical criteria: Illumina score >0.9 and class I type. The project aimed to develop two subsets of SNPs for the chip: a V. vinifera specific subset and a general Vitis species subset. For the V. vinifera subset, SNPs in regions involved in structural variations and repetitions were filtered and the remaining SNPs were then selected based on their even physical parition along the genome together with their MAF (Minimum Allele Frequence). For the Vitis species subset, SNPs in repeated regions were filtered out and the remaining SNPs were chosen based on their level of heterozygosity and evenly distributed along the genome. In the end, 14,817 Vitis vinifera SNPs and 4,978 Vitis species SNPs were selected along with 205 control SNPs to design a 20K grapevine Infinium genotyping chip (http://urgi.versailles.inra.fr/Species/Vitis/GrapeReSeq_Illumina_20K). Illumina designed an 18,071 SNP chip.

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1. Chip development

2. Chip delivery

<table>
<thead>
<tr>
<th>V. Vinifera set</th>
<th>Vitis species set</th>
<th>Chloroplast</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. SNP</td>
<td>13,537</td>
<td>4,510</td>
<td>24</td>
</tr>
</tbody>
</table>

Average distance between 2 SNP : chromosome distribution

3. Genotyping of 2278 individuals with 18071 SNP

Examples of problematic clusters

Cluster file freely available at http://urgi.versailles.inra.fr/Species/Vitis/GrapeReSeq_Illumina_20K

1 http://www.cnf.fr/fr/organisation/laboratories/ina_epgv
2 http://urgi.versailles.inra.fr
4 http://www.versailles.inra.fr/urgv
5 http://www.appliedgenomics.org
6 http://www.jki.bund.de/en/startseite/institute/rebenzuechtung.html
7 http://www.icvv.es/