Tutorial 2: Comparing multiple groups
Comparing Multiple Groups

- User can choose ANOVA tool to compare multiple groups of data.
- There are three ways to activate ANOVA
  1. from TOOL panel.
  2. from pull-down menu.
  3. from selected dataset (database panel).
     
     We recommend the third way.
Comparing Multiple Groups

User can use ANOVA to compare multiple groups. Running ANOVA is similar to running T-test (see tutorial 1 for detail about T-test).

1. Activate ANOVA from Tool panel
2. Activate ANOVA from pull-down menu
Comparing Multiple Groups – continued.

Right-click the selected datasets, choose “Analysis” -> T-Test/ANOVA.

3. Activate ANOVA from database panel
Comparing multiple groups - continued

Assign data into 3 groups

<table>
<thead>
<tr>
<th>Groups:</th>
<th>Assign to New Group</th>
<th>Unassign</th>
<th>Assign to...</th>
<th>Clear All Groups</th>
<th>Swap Dyes</th>
</tr>
</thead>
</table>

Assign Data Sets Into Groups

<table>
<thead>
<tr>
<th>Hybridization</th>
<th>SAMPLE 1</th>
<th>VITRO DOSING 1</th>
<th>LABEL 1</th>
<th>ARRAYTYPE/PNAME</th>
<th>SPECIES 1</th>
<th>ASSAY 1</th>
<th>CELLTYPE 1</th>
<th>SE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D0_T12_B_a</td>
<td>D0_T12_B</td>
<td>Compound C 0 1</td>
<td>Biotin</td>
<td>Affy_RT-U34</td>
<td>Rat</td>
<td>In Vitro</td>
<td>Hepatocytes</td>
</tr>
<tr>
<td></td>
<td>D0_T12_B_b</td>
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<td>Compound C 0 1</td>
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<tr>
<td></td>
<td>D0_T12_C_a</td>
<td>D0_T12_C</td>
<td>Compound C 0 1</td>
<td>Biotin</td>
<td>Affy_RT-U34</td>
<td>Rat</td>
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<td>Hepatocytes</td>
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<td>D0_T12_C</td>
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<td>D0_T12_D</td>
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<td>D2_T12_B</td>
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3 groups, sizes = [4, 4, 4]

T-Test fold changes are computed as grp1/grp2, so "up" regulation will mean grp1 > grp2 in any further analysis.

Next >
Comparing Multiple Groups - continued

<table>
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<th>Options for ANOVA</th>
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</table>

**Select Dataset Group Assignments for T-Test / ANOVA / Pairwise Tests**

**Test Type (Consistent with group selections)**
- ANOVA
- Pairwise T-Tests

**Filtering with a gene list**
- Only include genes from gene list

**Gene identifiers to include**
- Genbank Acc
- Gene Mfr ID
- LOCUSID
- UNIGENEID
- GENENAME
- CLONEID
- GEN_DESCR_MFR
- REFSEQ
- SPOTID

**Data options**
- Subtract backgrounds when present (raw datasets only)
- Apply logarithm to expression values
- Exclude spots flagged as bad
Comparing Multiple Groups - continued

ANOVA result of 3 groups

User can further filter the results by setting criteria like P value, fold change, etc.
Comparing Multiple Groups - continued

Options for Pairwise T-test
Comparing Multiple Groups - continued

Pairwise T-test result

Group 1 vs group 2

Group 1 vs group 3

Group 2 vs group 3

Clicking one of the three group buttons will bring the detail table of the comparing result. See Next slide.
Comparing Multiple Groups - continued