Table S1: Compatibility between matching tissues from different datasets.

Table S1A. Correlations between corresponding tissues from different sources as determined by the expression levels of commonly detected genes in each tissue pair.

<table>
<thead>
<tr>
<th>Expression data</th>
<th>Tissue</th>
<th>Rank</th>
<th>Kendall’s tau correlation</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transcript levels (GNF: RNA-seq)</td>
<td>Adipose</td>
<td>1</td>
<td>0.36</td>
<td>9.5e-130</td>
</tr>
<tr>
<td></td>
<td>Adrenal</td>
<td>2</td>
<td>0.26</td>
<td>3.12e-64</td>
</tr>
<tr>
<td></td>
<td>Brain</td>
<td>1</td>
<td>0.34</td>
<td>4.2e-225</td>
</tr>
<tr>
<td></td>
<td>Colon</td>
<td>1</td>
<td>0.35</td>
<td>5.71e-132</td>
</tr>
<tr>
<td></td>
<td>Heart</td>
<td>1</td>
<td>0.32</td>
<td>1.09e-126</td>
</tr>
<tr>
<td></td>
<td>Kidney</td>
<td>1</td>
<td>0.33</td>
<td>3.33e-82</td>
</tr>
<tr>
<td></td>
<td>Liver</td>
<td>1</td>
<td>0.39</td>
<td>8.56e-136</td>
</tr>
<tr>
<td></td>
<td>Lung</td>
<td>1</td>
<td>0.37</td>
<td>1.38e-157</td>
</tr>
<tr>
<td></td>
<td>Lymph Node</td>
<td>1</td>
<td>0.35</td>
<td>4.66e-113</td>
</tr>
<tr>
<td></td>
<td>Ovary</td>
<td>1</td>
<td>0.31</td>
<td>8.95e-58</td>
</tr>
<tr>
<td></td>
<td>Prostate</td>
<td>1</td>
<td>0.31</td>
<td>2.44e-120</td>
</tr>
<tr>
<td></td>
<td>Skeletal Muscle</td>
<td>1</td>
<td>0.3</td>
<td>2.92e-55</td>
</tr>
<tr>
<td></td>
<td>Testis</td>
<td>1</td>
<td>0.35</td>
<td>1.78e-161</td>
</tr>
<tr>
<td></td>
<td>Thyroid</td>
<td>1</td>
<td>0.36</td>
<td>2.45e-174</td>
</tr>
<tr>
<td></td>
<td>WBC</td>
<td>1</td>
<td>0.37</td>
<td>1.98e-297</td>
</tr>
<tr>
<td>Protein and gene expression levels (HPA: GNF or RNA-seq)</td>
<td>Adrenal</td>
<td>1</td>
<td>0.07</td>
<td>9.72e-05</td>
</tr>
<tr>
<td></td>
<td>Brain</td>
<td>1</td>
<td>0.12</td>
<td>3.57e-44</td>
</tr>
<tr>
<td></td>
<td>Breast</td>
<td>3</td>
<td>0.07</td>
<td>1.92e-11</td>
</tr>
<tr>
<td></td>
<td>Colon</td>
<td>1</td>
<td>0.06</td>
<td>0.00061829</td>
</tr>
<tr>
<td></td>
<td>Heart</td>
<td>1</td>
<td>0.07</td>
<td>2.14e-11</td>
</tr>
<tr>
<td></td>
<td>Kidney</td>
<td>1</td>
<td>0.106</td>
<td>7.89e-07</td>
</tr>
<tr>
<td></td>
<td>Liver</td>
<td>1</td>
<td>0.11</td>
<td>3.69e-24</td>
</tr>
<tr>
<td></td>
<td>Lung</td>
<td>1</td>
<td>0.09</td>
<td>2.24e-24</td>
</tr>
<tr>
<td></td>
<td>Lymph Node</td>
<td>1</td>
<td>0.11</td>
<td>1.97e-08</td>
</tr>
<tr>
<td></td>
<td>Ovary</td>
<td>1</td>
<td>0.09</td>
<td>8.31e-18</td>
</tr>
<tr>
<td></td>
<td>Prostate</td>
<td>1</td>
<td>0.12</td>
<td>4.74e-11</td>
</tr>
<tr>
<td></td>
<td>Skeletal Muscle</td>
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<td>0.03</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>Testis</td>
<td>1</td>
<td>0.13</td>
<td>9.36e-51</td>
</tr>
<tr>
<td></td>
<td>Thyroid</td>
<td>1</td>
<td>0.09</td>
<td>2.75e-23</td>
</tr>
</tbody>
</table>

1 The ranking of the correlation value of corresponding tissues (e.g. Adipose in GNF versus Adipose in RNA-seq) compared to non-corresponding tissues (e.g. Adipose in GNF versus Colon in RNA-seq). Highest correlation value is ranked 1.

2 GNF tissues best correlated with their corresponding RNA-seq tissues in 14 of the 15 tissues that were measured by both GNF and RNA-seq.

3 HPA tissues best correlated with their corresponding gene tissues in 13 of the 14 tissues for which protein expression levels were measured (best rank shown).
Table S1B. Overlap in edges between matching tissues shows significant overlap between different sources.

<table>
<thead>
<tr>
<th>Tissue</th>
<th>GNF Edges</th>
<th>HPA Edges</th>
<th>RNA-Seq edges</th>
<th>GNF/RNA-Seq %overlap</th>
<th>P value&lt;sup&gt;2&lt;/sup&gt;</th>
<th>HPA/RNA-Seq %overlap</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adipose</td>
<td>5176</td>
<td>N/A</td>
<td>36291</td>
<td>70.92</td>
<td>4.8e-151</td>
<td>N/A</td>
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</tr>
<tr>
<td>Adrenal</td>
<td>4869</td>
<td>18499</td>
<td>38036</td>
<td>68.12</td>
<td>8.7e-68</td>
<td>71.97</td>
<td>0</td>
</tr>
<tr>
<td>Brain</td>
<td>11202</td>
<td>20557</td>
<td>37122</td>
<td>70.51</td>
<td>8.4e-294</td>
<td>70.89</td>
<td>0</td>
</tr>
<tr>
<td>Breast</td>
<td>N/A</td>
<td>18042</td>
<td>37624</td>
<td>N/A</td>
<td>70.82</td>
<td>0</td>
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</tr>
<tr>
<td>Colon</td>
<td>6417</td>
<td>19680</td>
<td>37002</td>
<td>68.87</td>
<td>3.8e-128</td>
<td>70.71</td>
<td>0</td>
</tr>
<tr>
<td>Heart</td>
<td>7684</td>
<td>11811</td>
<td>34379</td>
<td>67.28</td>
<td>7.3e-207</td>
<td>66.90</td>
<td>4.9e-324</td>
</tr>
<tr>
<td>Kidney</td>
<td>3112</td>
<td>21025</td>
<td>37657</td>
<td>65.16</td>
<td>1.4e-27</td>
<td>71.42</td>
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</tr>
<tr>
<td>Liver</td>
<td>4470</td>
<td>14176</td>
<td>30416</td>
<td>65.32</td>
<td>2.7e-174</td>
<td>59.40</td>
<td>9.9e-324</td>
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<tr>
<td>Lung</td>
<td>6779</td>
<td>20288</td>
<td>38480</td>
<td>66.98</td>
<td>1.1e-69</td>
<td>71.72</td>
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<tr>
<td>Lymph Node</td>
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<td>16759</td>
<td>39057</td>
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<td>1.1e-69</td>
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<tr>
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<td>38511</td>
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<td>1.8e-29</td>
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<tr>
<td>Prostate</td>
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<td>16888</td>
<td>39029</td>
<td>68.78</td>
<td>1.5e-90</td>
<td>72.73</td>
<td>0</td>
</tr>
<tr>
<td>Skeletal Muscle</td>
<td>2523</td>
<td>11400</td>
<td>31616</td>
<td>64.96</td>
<td>1.8e-77</td>
<td>62.48</td>
<td>1.1e-294</td>
</tr>
<tr>
<td>Testis</td>
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<td>21232</td>
<td>41173</td>
<td>72.46</td>
<td>6.0e-103</td>
<td>75.54</td>
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<td>38193</td>
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<td>4.0e-182</td>
<td>73.21</td>
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<td>WBC</td>
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<td>N/A</td>
<td>33725</td>
<td>68.76</td>
<td>0</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

<sup>1</sup> Percent is based on fraction of overlap out of the smaller set.

<sup>2</sup> Computed using Fisher exact test.