Table S1. $^{13}$C chemical shifts of sugars$^a$ in artificial mixture (bold) and in honey (italics). The numbering system is shown in Fig. 1.

<table>
<thead>
<tr>
<th>Sugar</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>C4</th>
<th>C5</th>
<th>C6</th>
<th>C1'</th>
<th>C2'</th>
<th>C3'</th>
<th>C4'</th>
<th>C5'</th>
<th>C6'</th>
<th>C1''</th>
<th>C2''</th>
<th>C3''</th>
<th>C4''</th>
<th>C5''</th>
<th>C6''</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monosaccharides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\alpha$-D-glycopyranose (1$\alpha$-GP)</td>
<td>92.66</td>
<td>72.05</td>
<td>73.34</td>
<td>70.22</td>
<td>71.99</td>
<td>61.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\beta$-D-glycopyranose (1$\beta$-GP)</td>
<td>96.47</td>
<td>74.70</td>
<td>76.32</td>
<td>70.17</td>
<td>76.30</td>
<td>61.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\alpha$-D-fructopyranose (2$\alpha$-FP)</td>
<td>65.74</td>
<td></td>
<td>71.03</td>
<td>71.03</td>
<td>61.70</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\beta$-D-fructopyranose (2$\beta$-FP)</td>
<td>64.46</td>
<td>98.63</td>
<td>68.13</td>
<td>70.25</td>
<td>69.77</td>
<td>63.92</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\alpha$-D-fructofuranose (2$\alpha$-FF)</td>
<td>63.48</td>
<td>104.99</td>
<td>82.54</td>
<td>76.61</td>
<td>81.86</td>
<td>61.66</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\beta$-D-fructofuranose (2$\beta$-FF)</td>
<td>63.24</td>
<td>102.06</td>
<td>75.95</td>
<td>74.98</td>
<td>81.23</td>
<td>62.94</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disaccharides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\alpha$-D-maltose (3$\alpha$-GP)</td>
<td>100.18</td>
<td>72.30</td>
<td>73.40</td>
<td>69.89</td>
<td>73.21</td>
<td>61.05</td>
<td>92.42</td>
<td>71.84</td>
<td>73.77</td>
<td>77.49</td>
<td>70.49</td>
<td>61.15</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\beta$-D-maltose (3$\beta$-GP)</td>
<td>100.13</td>
<td>72.22</td>
<td>73.40</td>
<td>69.89</td>
<td>73.21</td>
<td>61.06</td>
<td>96.31</td>
<td>74.54</td>
<td>76.74</td>
<td>77.28</td>
<td>75.09</td>
<td>61.31</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\alpha$-D-isomaltose (4$\alpha$-GP)</td>
<td>98.55</td>
<td>72.09</td>
<td>73.60</td>
<td>70.08</td>
<td>72.38</td>
<td>61.07</td>
<td>92.76</td>
<td>72.00</td>
<td>73.57</td>
<td>70.13</td>
<td>70.61</td>
<td>66.33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\beta$-D-isomaltose (4$\beta$-GP)</td>
<td>98.51</td>
<td>72.05</td>
<td>73.63</td>
<td>70.08</td>
<td>72.35</td>
<td>61.04</td>
<td>96.66</td>
<td>74.63</td>
<td>76.54</td>
<td>69.94</td>
<td>74.87</td>
<td>66.25</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$\alpha$-D-nigerose (5$\alpha$-GP)</td>
<td>99.63</td>
<td>72.20$^b$</td>
<td>73.46</td>
<td>70.00</td>
<td>72.32$^b$</td>
<td>60.94</td>
<td>92.80</td>
<td>70.67</td>
<td>80.17</td>
<td>70.59</td>
<td>71.76</td>
<td>60.77</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saccharide Type</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>β-D-nigerose (5β-GP)</td>
<td>99.53  72.20b  73.44  69.86  72.29b  60.94  96.53  73.40  82.69  70.61  76.21  61.10</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sucrose (6β-FF)</td>
<td>92.72  71.61  73.11  69.76  72.94  60.66  61.88  104.23  76.94  74.53  81.91  62.91</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>turanose (7α-FF)</td>
<td>97.41  71.76  73.44  69.88  72.80  60.84  63.28  104.81  85.33  75.06  82.07  61.57</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Turanose (7β-FF)</td>
<td>99.03  71.98  73.23  69.88  72.88  60.84  63.40  102.25  81.07  74.90  81.40  62.84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>turanose (7β-PP)</td>
<td>101.49 72.58  73.44  69.88  73.30  61.02  64.60  98.28  77.22  70.85  69.64  63.92</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maltulose (8α-FF)</td>
<td>98.27  71.74  73.31  69.97  72.97  60.97  63.20  105.81  80.63  82.72  81.69  61.90</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maltulose (8β-FF)</td>
<td>98.86  71.77  73.27  69.97  72.94  60.94  62.91  102.49  75.77  81.75  80.54  63.27</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>maltulose (8β-PP)</td>
<td>101.08 72.36  73.41  70.16  72.87  61.10  64.32  98.86  67.45  78.59  69.74  64.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Trisaccharides**

<table>
<thead>
<tr>
<th>Saccharide Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erllose (9β-FF)</td>
</tr>
<tr>
<td>a-D-maltotriose (10α-GP)</td>
</tr>
<tr>
<td>β-D-maltotriose (10β-GP)</td>
</tr>
<tr>
<td>a-D-isomaltotriose (11α-GP)</td>
</tr>
<tr>
<td>β-D-isomaltotriose (11β-GP)</td>
</tr>
<tr>
<td>a-D-panose (12α-GP)</td>
</tr>
<tr>
<td>β-D-panose (12β-GP)</td>
</tr>
<tr>
<td>Chemical Shifts (ppm)</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

*the tautomeric form of the reducing sugar is denoted in parentheses.

Chemical shifts may be interchanged
Table S2. Assignment of the carbon resonances in the five $^{13}$C NMR subspectra of Fig. S3a to S3e.

<table>
<thead>
<tr>
<th>Signal</th>
<th>Tautomer$^{a,b}$</th>
<th>Signal</th>
<th>Tautomer</th>
<th>Signal</th>
<th>Tautomer</th>
<th>Signal</th>
<th>Tautomer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2αFF$^2$, 2αFP$^2$</td>
<td>15</td>
<td>5βGP$^1$, 5αGP$^1$</td>
<td>29</td>
<td>7αFF$^3$</td>
<td>43</td>
<td>12βGP$^{4''}$, 10βGP$^{4''}$</td>
</tr>
<tr>
<td>2</td>
<td>7αFF$^2$</td>
<td>16</td>
<td>7βFF$^1$</td>
<td>30</td>
<td>13αGP$^3$</td>
<td>44</td>
<td>10βGP$^{4''}$, 10αGP$^4$, 9βFF$^4$, 3βGP$^4$, 3αGP$^4$</td>
</tr>
<tr>
<td>3</td>
<td>9βFF$^{2''}$, 6βFF$^3$</td>
<td>17</td>
<td>12βGP$^1$, 12αGP$^1$, 8βFP$^2$, 8βFF$^3$, 2βFP$^2$, 11βFP$^2$</td>
<td>31</td>
<td>8αFF$^3$, 5βGP$^3$</td>
<td>45</td>
<td>14βFF$^3$, 14βFF$^3$, 7βFP$^3$</td>
</tr>
<tr>
<td>4</td>
<td>13αGP$^{2''}$, 12βGP$^{2''}$, 13αGP$^{2''}$, 14βFF$^2$</td>
<td>18</td>
<td>11αGP$^3$, 4αGP$^1$</td>
<td>32</td>
<td>2αFF$^3$, 2αGP$^3$</td>
<td>46</td>
<td>6βFF$^3$</td>
</tr>
<tr>
<td>5</td>
<td>13αGP$^{2''}$, 14βFF$^2$</td>
<td>19</td>
<td>11βGP$^{1''}$, 11αGP$^1$, 8αFF$^3$, 7βFP$^3$, 4βGP$^1$</td>
<td>33</td>
<td>7αFF$^5$, 6βFF$^5$</td>
<td>47</td>
<td>12βGP$^3$</td>
</tr>
<tr>
<td>6</td>
<td>8βFF$^{2''}$</td>
<td>20</td>
<td>7αFF$^1$</td>
<td>34</td>
<td>9βFF$^5''$</td>
<td>48</td>
<td>3βGP$^3$</td>
</tr>
<tr>
<td>7</td>
<td>7βFF$^1$</td>
<td>21</td>
<td>11βGP$^{1''}$, 4βGP$^1$, 1αGP$^1$</td>
<td>35</td>
<td>14βFF$^5''$, 2αFF$^5$</td>
<td>49</td>
<td>4βGP$^3$, 2αFP$^4$, 2αFF$^4$</td>
</tr>
<tr>
<td>8</td>
<td>2βFF$^2$</td>
<td>22</td>
<td>5βGP$^1$, 1βGP$^1$</td>
<td>36</td>
<td>13αGP$^{5''}$, 14βFF$^5''$, 8βFF$^4$, 8αFF$^5''$</td>
<td>50</td>
<td>10αGP$^4''$, 1βGP$^5$, 1βGP$^3$</td>
</tr>
<tr>
<td>9</td>
<td>7βFP$^1$</td>
<td>23</td>
<td>12βGP$^{1''}$, 10βGP$^{1''}$, 3βGP$^{1''}$</td>
<td>37</td>
<td>7βFP$^3$</td>
<td>51</td>
<td>10βGP$^{3''}$</td>
</tr>
<tr>
<td>10</td>
<td>8βFP$^1$</td>
<td>24</td>
<td>11αGP$^{2''}$</td>
<td>38</td>
<td>2βFF$^3$, 2αFP$^5$</td>
<td>52</td>
<td>5βGP$^5''$</td>
</tr>
<tr>
<td>11</td>
<td>13αGP$^1$</td>
<td>25</td>
<td>14βFF$^1$</td>
<td>39</td>
<td>7βFP$^3$</td>
<td>53</td>
<td>2βFF$^3$</td>
</tr>
<tr>
<td>12</td>
<td>12αGP$^1$, 10βGP$^1$, 9βFF$^3$, 10αGP$^1''$</td>
<td>26</td>
<td>10αGP$^{1''}$, 6βFF$^1$, 5αGP$^1$, 4αGP$^1$, 3αGP$^1$</td>
<td>40</td>
<td>8βFF$^5$, 8αFF$^4$</td>
<td>54</td>
<td>8βFF$^3$</td>
</tr>
<tr>
<td>13</td>
<td>12βGP$^{3''}$</td>
<td>27</td>
<td>12αGP$^{1''}$, 9βFF$^1$</td>
<td>41</td>
<td>8βFP$^4$, 5αGP$^3$</td>
<td>55</td>
<td>12αGP$^{5''}$</td>
</tr>
<tr>
<td>14</td>
<td>10βGP$^3$, 10αGP$^3$, 3βGP$^1$, 3αGP$^1$</td>
<td>28</td>
<td>13αGP$^1$</td>
<td>42</td>
<td>12αGP$^{4''}$</td>
<td>56</td>
<td>10βGP$^{5''}$, 7αFF$^3$, 3βGP$^{5''}$</td>
</tr>
<tr>
<td>Signal</td>
<td>Tautomer</td>
<td>Signal</td>
<td>Tautomer</td>
<td>Signal</td>
<td>Tautomer</td>
<td>Signal</td>
<td>Tautomer</td>
</tr>
<tr>
<td>--------</td>
<td>----------</td>
<td>--------</td>
<td>----------</td>
<td>--------</td>
<td>----------</td>
<td>--------</td>
<td>----------</td>
</tr>
<tr>
<td>57</td>
<td>14βFF⁴',2βFF⁵</td>
<td>69</td>
<td>13αGP²,12βGP⁵,12αGP⁵,11βGP⁵',11αGP²,10βGP²,10αGP²,8βFP⁵',5βGP⁵,5βGP⁴,4αGP⁵,4βGP⁵',3αGP²,5αGP³,5αGP²</td>
<td>81</td>
<td>12βGP⁴',12αGP⁴,11βGP⁴,11αGP⁴,1αGP⁴</td>
<td>93</td>
<td>8βFP⁵',8αFF¹',2βFP⁶</td>
</tr>
<tr>
<td>58</td>
<td>11βGP⁵',4βGP⁵</td>
<td>70</td>
<td>12βGP²,12αGP²,10αGP²',5βGP²',3βGP²</td>
<td>82</td>
<td>13αGP⁴,13αGP⁴,11βGP⁴',11αGP⁴,11αGP⁴,8βFP⁵,4αGP⁴,4βGP⁴,4αGP⁴,1βGP⁵</td>
<td>94</td>
<td>7βFP⁵',7βFP⁵',2αF¹</td>
</tr>
<tr>
<td>59</td>
<td>12αGP²,11βGP²',11αGP²',4βGP²',1βGP²</td>
<td>71</td>
<td>13αGP²,12αGP²,12αGP²,11βGP²',11αGP²,11αGP²',11αGP²,10αGP²,6βFF⁵',1αGP²,1αGP²,4αGP²,4βGP²</td>
<td>83</td>
<td>12αGP⁴,12αGP⁴,11βGP⁴',10βGP⁴,10αGP⁴,9βFP⁴,8αFF⁴,8βFP⁴,7αFF⁴,7βFP⁴,5βGP⁴,4βGP⁴,3βGP⁴,3αGP⁴</td>
<td>95</td>
<td>8βFP⁶',7αFF⁶',2βF¹</td>
</tr>
<tr>
<td>60</td>
<td>14βFF⁴,12βGP²',11βGP²',10βGP²',9βFF⁴,6βFF⁴,3βGP²</td>
<td>72</td>
<td>11βGP²',11αGP²,7βFP²,4αGP²</td>
<td>84</td>
<td>14βFF⁴,8βFP⁵,7βFP⁵,7βFP⁴,6βFP⁵,2βFP⁵'</td>
<td>96</td>
<td>14βFF⁶',9βFP⁵',7βFP⁵',6βFF⁶',2βFP⁵'</td>
</tr>
<tr>
<td>61</td>
<td>13αGP²,12αGP⁵',11αGP²,10βGP³,10αGP³,10αGP³,3αGP²</td>
<td>73</td>
<td>12βGP²,12αGP²,3αGP²</td>
<td>85</td>
<td>2βFP³</td>
<td>97</td>
<td>13αGP²',14βFP⁶',7βFP⁵</td>
</tr>
</tbody>
</table>

**Notes:**
- The table lists various combinations of tautomers, likely referring to different chemical or biological states.
- The entries under 'Tautomer' include combinations of Greek letters and numbers, which might represent specific chemical compositions or categories.

**Additional Information:**
- The table appears to be a scientific or technical reference, possibly related to biochemistry or a similar field, given the presence of Greek letters and chemical symbols.
| 62 | 13αGP<sup>ε</sup>,12βGP<sup>ε</sup>,12αGP<sup>ε</sup>,12βGP<sup>ε</sup>,11αGP<sup>ε</sup>,11βGP<sup>ε</sup>,11αGP<sup>p</sup>,10βGP<sup>p</sup>,10αGP<sup>ε</sup>,9βFP<sup>p</sup>,4αGP<sup>p</sup>,4αGP<sup>ε</sup> | 74 | 14βFF<sup>3</sup>,8αFF<sup>3</sup>,8βFF<sup>3</sup>,7αFF<sup>3</sup>,5αGP<sup>ε</sup> | 86 | 8βFP<sup>ε</sup> | 98 | 13αGP<sup>ε</sup> |
| 63 | 13αGP<sup>ε</sup>,14βFF<sup>3</sup>,9βFF<sup>ε</sup>,8βFP<sup>3</sup>,7αFF<sup>3</sup>,7βFP<sup>p</sup>,3βGP<sup>p</sup>,3αGP<sup>p</sup> | 75 | 9βFF<sup>3</sup>,6βFF<sup>2</sup> | 87 | 11βGP<sup>ε</sup> | 99 | 9βFF<sup>ε</sup>,8αFF<sup>ε</sup>,8βFF<sup>n</sup>,6βFF<sup>n</sup>,2αFP<sup>ε</sup> |
| 64 | 8βFF<sup>3</sup>,8αFF<sup>3</sup>,7βFP<sup>p</sup>,5βGP<sup>p</sup>,1αGP<sup>p</sup> | 76 | 13αGP<sup>ε</sup> | 88 | 12βGP<sup>ε</sup>,12αGP<sup>ε</sup> | 100 | 7αFF<sup>ε</sup>,7αFP<sup>ε</sup>,2αFP<sup>p</sup>,2αFP<sup>ε</sup> |
| 65 | 10βGP<sup>ε</sup>,9βFF<sup>3</sup>,10αGP<sup>p</sup>,7βFF<sup>p</sup>,3βGP<sup>p</sup>,3αGP<sup>p</sup> | 77 | 9βFF<sup>2</sup> | 89 | 11αGP<sup>ε</sup>,4αGP<sup>ε</sup> | 101 | 14βFF<sup>n</sup>,12βGP<sup>ε</sup>,3βGP<sup>ε</sup>,1βGP<sup>p</sup> |
| 66 | 6βFF<sup>3</sup> | 78 | 10βGP<sup>ε</sup>,10βGP<sup>p</sup>,10αGP<sup>ε</sup>,9βFF<sup>ε</sup>,7βFP<sup>p</sup> | 90 | 4βGP<sup>ε</sup> | 102 | 13αGP<sup>ε</sup>,12αGP<sup>ε</sup>,10βGP<sup>ε</sup>,5βGP<sup>ε</sup>,3αGP<sup>p</sup> |
| 67 | 14βFF<sup>3</sup>,9βFF<sup>ε</sup>,8αFF<sup>3</sup>,8βFF<sup>ε</sup>,7βFF<sup>ε</sup> | 79 | 11βGP<sup>ε</sup>,11αGP<sup>ε</sup>,9βFF<sup>ε</sup>,10αGP<sup>ε</sup>,5βGP<sup>ε</sup>,5αGP<sup>p</sup>,4αGP<sup>ε</sup>,3αGP<sup>ε</sup> | 91 | 2βFP<sup>ε</sup> | 103 | 13αGP<sup>ε</sup>,14βFF<sup>n</sup>,12αGP<sup>ε</sup>,12αGP<sup>p</sup>,11βGP<sup>p</sup>,11αGP<sup>ε</sup>,10βGP<sup>ε</sup>,10βGP<sup>p</sup>,10βGP<sup>ε</sup>,10αGP<sup>ε</sup>,10αGP<sup>p</sup>,9βFP<sup>p</sup>,8βFP<sup>p</sup>,8αFP<sup>p</sup>,8βFF<sup>ε</sup>,7βFP<sup>p</sup>,7βFP<sup>ε</sup>,5βGP<sup>p</sup>,5αGP<sup>ε</sup>,4αGP<sup>p</sup>,4αGP<sup>p</sup>,3βGP<sup>p</sup>,3αGP<sup>p</sup>,1αGP<sup>p</sup> |
| 68 | 13αGP<sup>ε</sup>,8βFP<sup>p</sup>,7αFF<sup>ε</sup> | 80 | 2βFP<sup>ε</sup> | 92 | 8βFP<sup>ε</sup>,7βFP<sup>ε</sup>,2βFP<sup>ε</sup> | 104 | 14βFF<sup>ε</sup>,9βFF<sup>ε</sup>,6βFF<sup>ε</sup> |

<sup>a</sup>the tautomeric form of the reducing sugar is denoted for the tautomers (see Fig. 1)

<sup>b</sup>The superscript in each tautomer denotes carbon number (see Fig. 1)
**Table S3.** Comparison of the measured amount (%w/w) of each tautomer of D-fructose and D-glucose in the isoglucose mixture from integration of the $^{13}$C NMR signals to that of the actual concentration (weighted amount).

<table>
<thead>
<tr>
<th>Tautomers</th>
<th>Actual concentration</th>
<th>Concentration determined by $^{13}$C NMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\alpha$-D-fructofuranose</td>
<td>118.5</td>
<td>118.2</td>
</tr>
<tr>
<td>$\beta$-D-fructofuranose</td>
<td>1659.1</td>
<td>1654.1</td>
</tr>
<tr>
<td>$\alpha$-D-fructopyranose</td>
<td>47.4</td>
<td>44.5</td>
</tr>
<tr>
<td>$\beta$-D-fructopyranose</td>
<td>545.1</td>
<td>537.2</td>
</tr>
<tr>
<td>Total D-fructose</td>
<td>2370.1</td>
<td>2354.0</td>
</tr>
<tr>
<td>$\alpha$-D-glucopyranose</td>
<td>723.3</td>
<td>708.6</td>
</tr>
<tr>
<td>$\beta$-D-glucopyranose</td>
<td>1205.5</td>
<td>1183.3</td>
</tr>
<tr>
<td>Total D-glucose</td>
<td>1928.9</td>
<td>1891.9</td>
</tr>
</tbody>
</table>
Table S4. Comparison of the measured amount (% w/w) of each sugar tautomer in the artificial mixture from integration of the $^{13}$C NMR signals to that of the actual concentration (weighted amount).

<table>
<thead>
<tr>
<th>Tautomer</th>
<th>Actual concentration</th>
<th>Concentration determined by $^{13}$C NMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>α-D-fructofuranose (2α-FF)</td>
<td>118.5</td>
<td>117.6</td>
</tr>
<tr>
<td>turanose (7β-FF)</td>
<td>19.6</td>
<td>19.2</td>
</tr>
<tr>
<td>1-kestose (14β-FF)</td>
<td>9.9</td>
<td>9.6</td>
</tr>
<tr>
<td>maltulose (8β-FF)</td>
<td>20.2</td>
<td>20.4</td>
</tr>
<tr>
<td>turanose (7β-FP)</td>
<td>38.2</td>
<td>38.0</td>
</tr>
<tr>
<td>maltulose (8β-FP)</td>
<td>40.4</td>
<td>39.8</td>
</tr>
<tr>
<td>melisitose (13α-GP)</td>
<td>4.5</td>
<td>4.4</td>
</tr>
<tr>
<td>α-D-nigerose (5α-GP)</td>
<td>10.7</td>
<td>10.7</td>
</tr>
<tr>
<td>β-D-nigerose (5β-GP)</td>
<td>17.1</td>
<td>17.1</td>
</tr>
<tr>
<td>turanose (7α-FF)</td>
<td>39.2</td>
<td>38.5</td>
</tr>
<tr>
<td>β-D-glycopyranose (1β-GP)</td>
<td>1205.5</td>
<td>1188.0</td>
</tr>
<tr>
<td>β-D-fructofuranose (2β-FF)</td>
<td>545.1</td>
<td>543.9</td>
</tr>
<tr>
<td>erlose (9β-FF)</td>
<td>49.6</td>
<td>49.4</td>
</tr>
<tr>
<td>β-D-fructopyranose (2β-FP)</td>
<td>1659.1</td>
<td>1650.3</td>
</tr>
</tbody>
</table>
Table S2. Continued