Carbohydrate "Protecting Groups" do More Than Protect

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The coupling of **1** and **2** to give **3** is the fundamental process of oligosaccharide synthesis. The reaction involves stereo, regio, and chemo-selectivities, three requirements that are routinely encountered in all branches of organic synthesis. The fourth, enantioselectivity, is usually irrelevant with carbohydrate targets. As indicated, both the donor and acceptor must be equipped with "protecting groups"; but we have found that "protecting groups" affect all selectivities. This insight comes mainly from investigations involving *n*-pentenyl glycosyl donors such as **4** and **5**, which has enabled a synthesis of the 28-member oligosaccharide **6**, part of the surface antigen of *Mycobacterium tuberculosis.* Recent developments in the organic chemistry surrounding these investigations will be discussed.