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Crystal structures of peanut lectin complexed with Galβ1- 3Gal, methyl-T-antigen, Galβ1-6GalNAc, Gal1-3Gal and Gal1-6Glc and that of a crystal grown in the presence of Gal1 3Galβ1-4Gal have been determined using data collected at 100 K. The use of water bridges as a strategy for generating carbohydrate specificity was previously deduced from the complexes of the lectin with lactose (Galβ1-4Glc) and T-antigen (Galβ1-3GalNAc). This has been confirmed by the analysis of the complexes with Galβ1-3Gal and methyl-T antigen (Galβ1 3GalNAc-OMe). A detailed analysis of lectin–sugar interactions in the complexes shows that they are more extensive when the β-anomer is involved in the linkage. As expected, the second sugar residue is ill-defined when the linkage is 16. There are more than two dozen water molecules which occur in the hydration shells of all structures determined at resolutions better than 2.5 Å. Most of them are involved in stabilizing the structure, particularly loops. Water molecules involved in lectin–sugar interactions are also substantially conserved. The lectin molecule is fairly rigid and does not appear to be affected by changes in temperature.