Two key issues may influence research on GTs and MTs in the future. One will be concerned with the elucidation of specific protein structures to describe and understand how enzyme specificity is governed by individual protein domains. A solid basis has already been generated by our lab and the work of others using molecular modelling and crystallography to understand the principles of sugar and methyl group transfer to plant products. Progress to determine protein structures in solution by NMR spectroscopy could help to solve currently difficult or impossible to crystallize enzymes, like the soluble or membrane-bound glycosyl- and glucuronosyltransferases. Visions to create new enzymes with desired properties in silico or by rational experimental design may not be too far fetched. The second, even more ambitious task will be concerned with the function, regulation and integration of these enzymes into complex metabolic systems and requires support by genomics, proteomics, metabolomics, and bioinformatics. Based on the wealth of information and knowledge currently generated it will be only be a question of time that this research will result not only in scientific but also in economical benefits.

11. References


Notes added in proof:

The following important references with emphasis on the structural biochemistry of glycosyltransferases appeared after submission of this thesis:

