

## Carbohydrate-functionalised metal complexes: lectin-targeting glycoclusters for therapy & detection

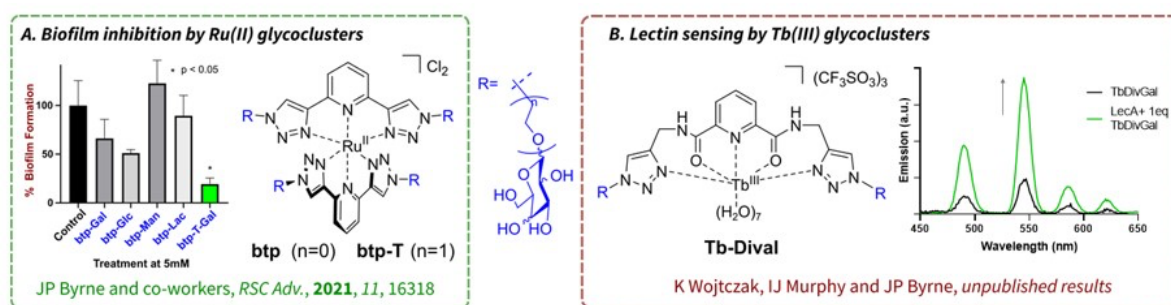
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Carbohydrates can confer metal complexes with many properties beneficial for bioinorganic chemistry, including well-defined stereochemistry and water-solubility. Moreover, targeted selective interactions with biomolecules, such as carbohydrate-binding proteins, offer potential pathways for therapeutic and diagnostic applications. Carbohydrate–protein interactions are key to the pathology of many bacterial infections; [1] targeting carbohydrate-binding proteins (lectins) of *P. aeruginosa* has recently become an area of increasing interest in glycoconjugate chemistry. [2] While various multivalent glycoconjugate approaches are reported, use of metal coordination chemistry in design of lectin-targeting compounds is underexploited.

Carbohydrate-functionalised coordination-complexes allow properties of both carbohydrates and metals to be exploited to address healthcare challenges. We have synthesised Ru(II)-centred glycoclusters for targeting lectins, whose ability to inhibit *P. aeruginosa* biofilm formation was found to depend on the identity and presentation of the carbohydrate motif. [3] Building on this work, we also designed novel luminescent lanthanide(III)-centred glycoclusters, which detect lectins (including LecA from *P. aeruginosa*), aiming for diagnostic applications. These luminescent systems show 'switch-on' sensing behaviour in the presence of several lectins, with the selectivity of the lectin for different carbohydrate structures determining the response. Studies are ongoing with other lectins of different selectivities to establish the scope of this sensing paradigm.



Carbohydrate-functionalised metal complexes with therapeutic and diagnostic potential

### Bibliographic references:

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