

Accepted Manuscript

Title: Phenylboronic Acid-Modified Oligoamine Sensitive to Monosaccharides and Carbon Dioxide under Physiological Conditions

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PII: S0927-7757(18)30462-X
DOI: <https://doi.org/10.1016/j.colsurfa.2018.05.084>
Reference: COLSUA 22552

To appear in: *Colloids and Surfaces A: Physicochem. Eng. Aspects*

Received date: 13-3-2018
Revised date: 27-5-2018
Accepted date: 28-5-2018

Please cite this article as: Joseph VS, Hong J-Dal, Phenylboronic Acid-Modified Oligoamine Sensitive to Monosaccharides and Carbon Dioxide under Physiological Conditions, *Colloids and Surfaces A: Physicochemical and Engineering Aspects* (2018), <https://doi.org/10.1016/j.colsurfa.2018.05.084>

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Phenylboronic Acid-Modified Oligoamine Sensitive to Monosaccharides and Carbon Dioxide under Physiological Conditions

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Graphical abstract



Dual stimuli-responsive receptor OAB showed excellent responsiveness to major endogenous metabolites, specifically carbon dioxide (CO₂) and monosaccharides glucose and fructose. The reversible complexation of the receptor with was controlled over time through slow bubbling of CO₂ and then nitrogen (N₂) into the solution. The receptor displayed strong binding to glucose (binding constant $K_{eq} = 5.8 M^{-1}$) and fructose ($K_{eq} = 73.4 M^{-1}$) at the physiological pH 7.4, respectively.

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