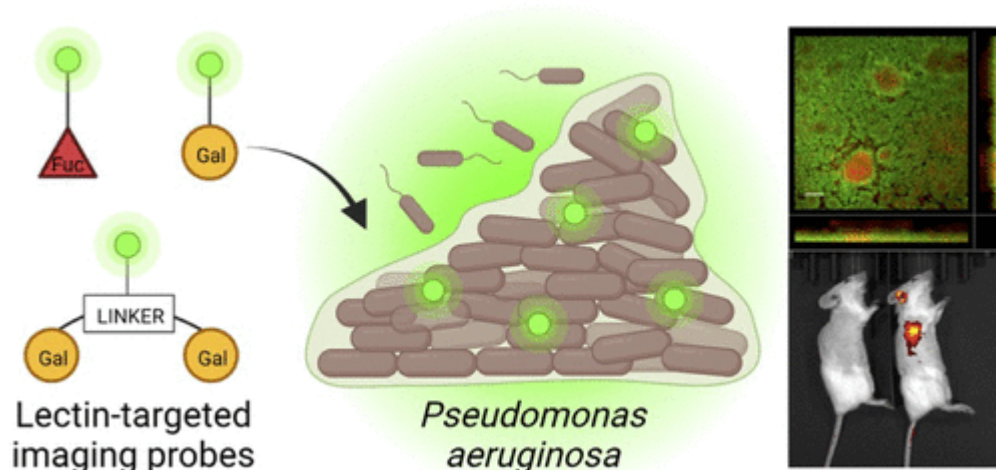


High-Affinity Lectin Ligands Enable the Detection of Pathogenic *Pseudomonas aeruginosa* Biofilms: Implications for Diagnostics and Therapy

Description

Pseudomonas aeruginosa is a critical priority pathogen and causes life-threatening acute and biofilm-associated chronic infections. Choosing suitable treatment for complicated infections requires lengthy culturing for species identification from swabs or an invasive biopsy. No fast, pathogen-specific diagnostic tools for *P. aeruginosa* infections are available. Here, the authors present the noninvasive pathogen-specific detection of *P. aeruginosa* using novel fluorescent probes that target the bacterial biofilm-associated lectins LecA and LecB. Several glycomimetic probes were developed to target these extracellular lectins and demonstrated the ability to stain *P. aeruginosa* biofilms *in vitro*. Importantly, for the targeting of LecA an activity boost to low-nanomolar affinity could be achieved, which is essential for *in vivo* application. *In vitro*, the nanomolar divalent LecA-targeted imaging probe accumulated effectively in biofilms under flow conditions, independent of the fluorophore identity.



Investigation of these glycomimetic imaging probes in a murine lung infection model and fluorescence imaging revealed accumulation at the infection site. These findings demonstrate the use of LecA- and LecB-targeting probes for imaging *P. aeruginosa* infections and suggest their potential as pathogen-

specific diagnostics to accelerate the start of the appropriate treatment.

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