HIGH-AFFINITY LECTIN LIGANDS ENABLE THE DETECTION OF PATHOGENIC *PSEUDOMONAS AERUGINOSA* BIOFILMS: IMPLICATIONS FOR DIAGNOSTICS AND THERAPY

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Pseudomonas aeruginosa is a critical priority I pathogen and causes life-threatening acute and biofilm-associated chronic infections. The choice of a suitable treatment for complicated infections requires lengthy culturing for species identification after swabs or invasive biopsy. To date, no fast and pathogen-specific diagnostic tools for *P. aeruginosa* infections are available. Here, we present the non-invasive 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 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 identity of the fluorophore. 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 the imaging of *P. aeruginosa* infections and suggest their potential as pathogen-specific diagnostics to accelerate the start of the appropriate treatment [1].

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