Finding a surface bioreceptor to identification of *S. pneumoniae*.

*José de Jesús Olivares-Trejo[1], Dan Israel Zavala-Vargas[1,2], Edgar Augusto Ortiz-Benítez [1,3] and Juan J. Mosqueda[4]
[1]*Universidad Autónoma de la Ciudad de México, Posgrado en Ciencias Genómicas*
[2]*Centro de Investigación y de Estudios Avanzados del I.P.N, Departamento de Bioquímica*
[3]*Instituto Politécnico Nacional, Unidad Profesional Interdisciplinaria de Biotecnología.*
[4]*Universidad Autónoma de Querétaro, Facultad de Ciencias Naturales*
*Corresponding author e-mail address: olivarestrejo@yahoo.com
San Lorenzo 290, Zip. 03100, Ciudad de México, México.
Tel.+525554886661 Ext. 15309, WhatsApp 5585537800

Abstract

Streptococcus pneumoniae a pathogen capable of causing different pathologies in humans[1]. Recent years, strains of resistant to the optochin test have been registered, one of the main methods of identification of this bacterium, causing false negatives on its identification [2,3]. Due to the growing disadvantages of these methods of identifying this pathogen, we have developed an efficient, novel and rapid method of identification based on gold nanoparticles (AuNp's) functionalized with aptamers. Aptamers are random ssDNA sequences that fold over themselves generating millions of different secondary structures, selecting those with the highest affinity for *S. pneumoniae.*

Objetive

Finding a surface bioreceptor to identification of *S. pneumoniae*.

Methodology

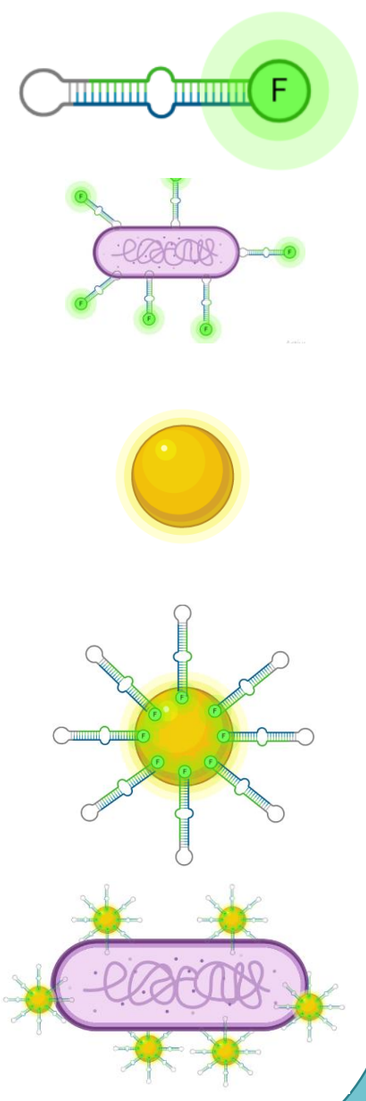
Aptamer selection (specific bind sequence ssDNA fluorescein-labeled)

Test the bind aptamer-*S. pneumoniae*

Sintesys AuNP's (50 nm)

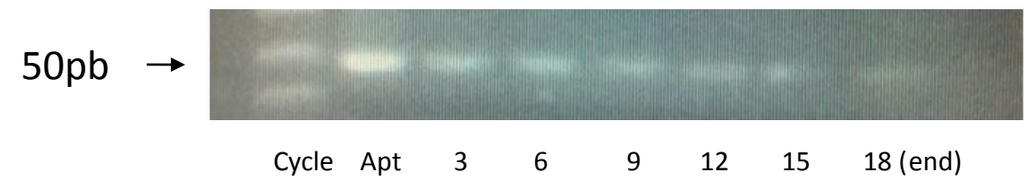
Functionalization AuNP'S with fluorescein-labeled aptamers

Evaluation of specific bind AuNP's *Streptococcus pneumoniae*

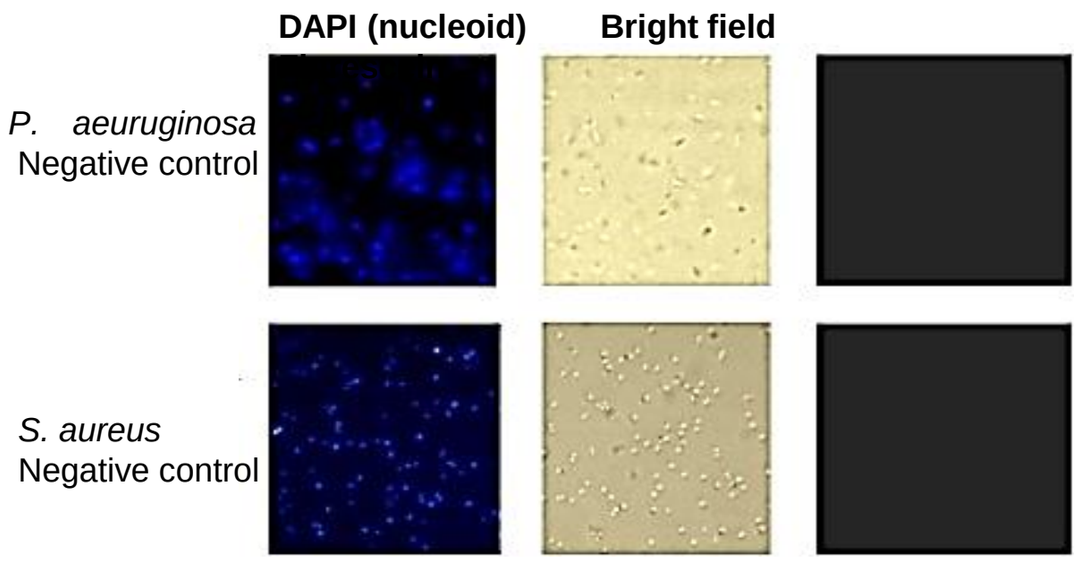


Results

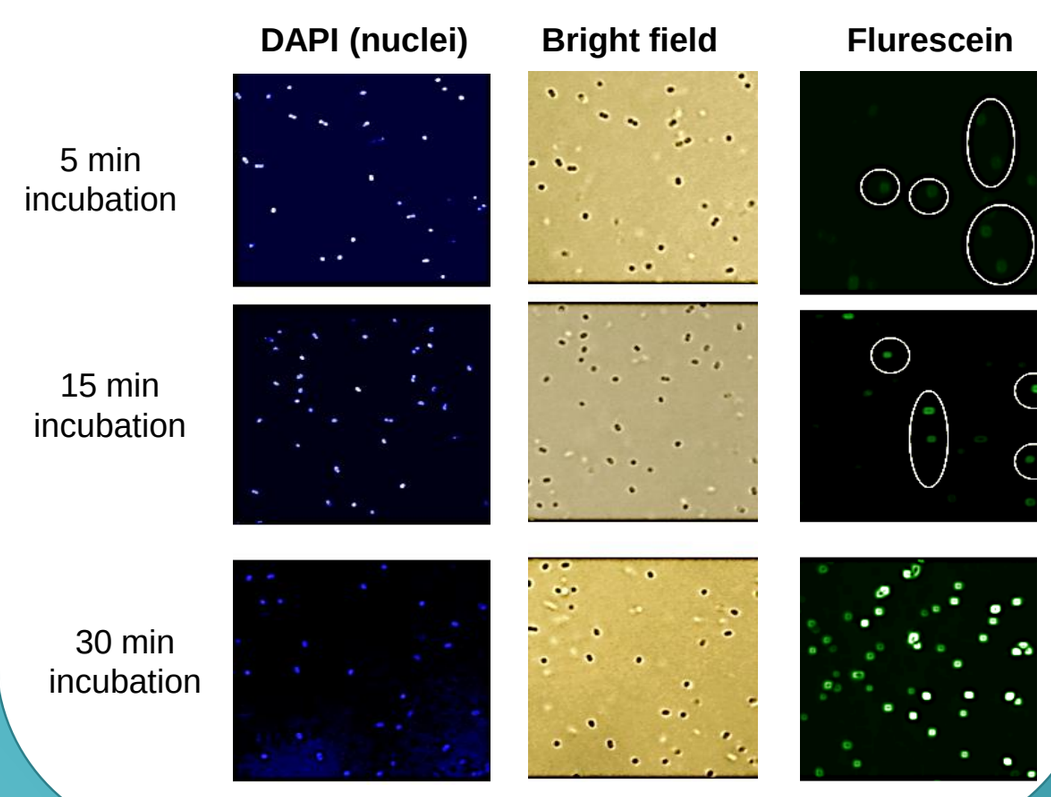
SDS-PAGE 12% aptamer selection rounds



AuNP's-Aptamers negatives controls



AuNP's-aptamers time trial against *S. pneumoniae*



Conclusion and perspective

Our results were successful once the gold nanoparticle was functionalized with the fluorescein-labeled aptamers (to be visible by fluorescence microscopy), specific binding to target bacteria *S. pneuminiae* was observed. The signal was observed with only 5 min of incubation and was maintained for 30 minutes, while no signal was observed with six negative controls (Data not shown). As perspective, Au-Np's have the quality to change color as they are added, so once they interact with *S. pneumoniae* they will be added changing from a red to purple color.

REFERENCES
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2. Instituto Nacional de Salud Colombia. Programa de Vigilancia de los serotipos y Resistencia Antimicrobiana de Streptococcus pneumoniae y Haemophilus influenzae. Manual de procedimientos. 2004. Versión 4. 33-99.
3. S. Kontiainen and A. Sivonen, "Optochin Resistance in Streptococcus pneumoniae Strains Isolated from Blood and Middle Ear Fluid," European Journal of Clinical Microbiology, Vol. 6, No. 4, 1987, pp. 422-424.