Peptide Inhibitors of Gonorrhoeae

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Technology description

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Antigonococcal peptide inhibitors of Neisseria gonorrhoeae that act against a non-conventional new target, nitrite reductase AniA, that is necessary for N. gonorrhoeae anaerobic respiration and biofilm formation. The anaerobic life style is an important state during disease and favored in biofilms, which form in cervical gonococcal infections. In nitrite consumption assays carried out with two separate peptides, 90-50% inhibition of nitrite reductase activity was observed at concentrations of 0.6 and 0.3 mM, respectively. Work conducted to-date demonstrates the peptide as the first identified inhibitor of nitrite reductase with promising inhibitory activity in vitro as well as in whole cell assay. Finally, the MIC50 value for the original peptide C7-3 and its derivative C7-3m2 against anaerobically grown N. gonorrhoeae was 0.6 mM. It is believed the pharmacologic inhibition of targeted enzyme will reduce fitness of gonococcus in the genital tract, where oxygen tension is reduced, and augment the ability of existing antimicrobials to clear the pathogen (OSU no. 16-52).

Industry Research Interests

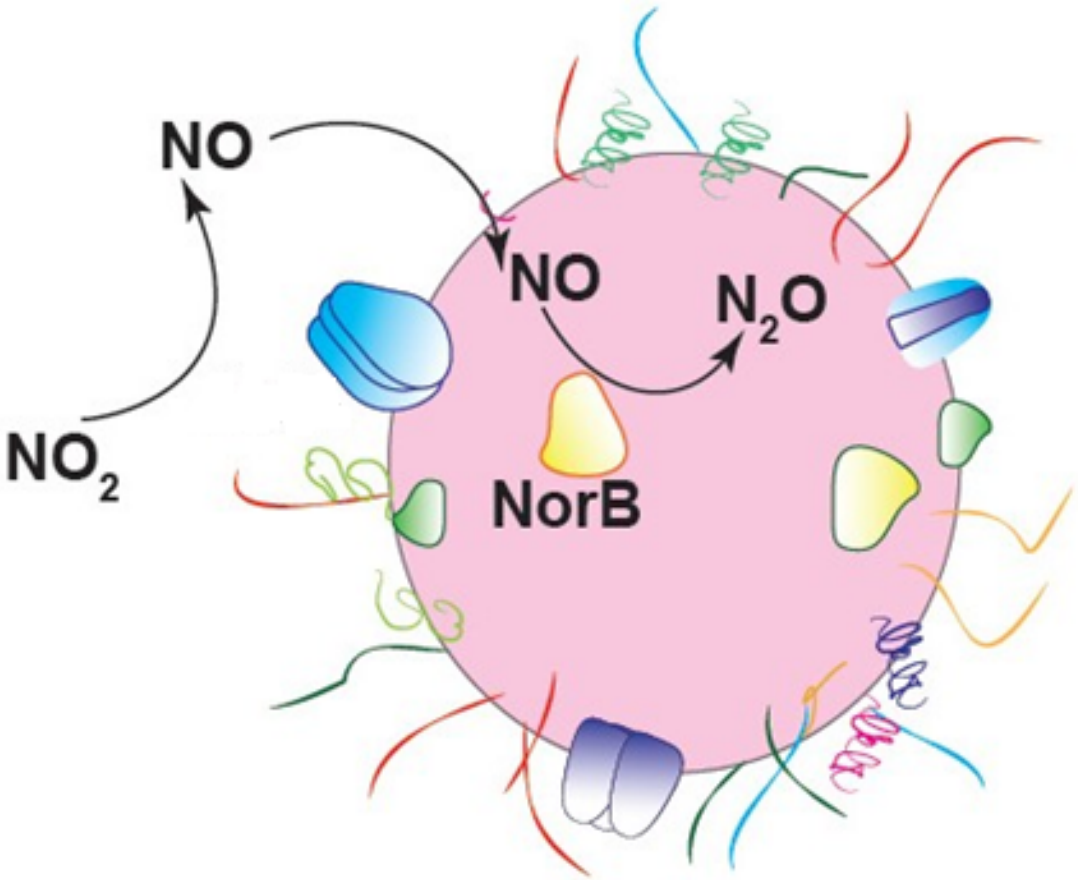
To develop new antigonococcal drugs focused on non-traditional targets including AniA and ObgGTPase

To develop new broad-spectrum antibiotics

To develop vaccine(s) for gonorrhea

Background of Invention

Neisseria gonorrhoeae causes the sexually transmitted infection, gonorrhea, which is highly prevalent worldwide and has a major impact on reproductive and neonatal health. Among human-colonizing Neisseria species only N. gonorrhoeae, the causative agent of gonorrhea, is always considered pathogenic. Gonorrhea remains a serious public health concern with 78 million new cases annually worldwide. The “superbug” status of N. gonorrhoeae necessitates development of drugs with different mechanism of action.



Application area

Antigonococcal therapeutic
Antigonococcal drug development
Antigonococcal combinatorial therapy

Advantages

Antigonococcal peptides that provide the first nitrite reductase inhibitors
Strong potential for combinatorial treatment with existing or new antibiotics

Institution

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