Streptococcus pyogenes: The Future State of Streptococcus

Authors: William Wood Jessica Smith Jesus Munoz Christina Nguyen Megan Novak

Published Date: 04-22-2017

University of Phoenix-Phoenix Campus

School of Biology

Streptococcus pyogenes is a bacterium most known as an enabler of infectious diseases, such as asthma, systemic pneumonia, and sepsis. Its bacterial distribution as well as its resistance to antibiotics will forever be called a â€œdisease modelâ€ for therapeutic and pharmaceutical research. Almost without exception, the bacterium is normally eliminated by cellular processing mechanisms. However, an increasing number of streptococci are causing severe infections and hence at least some other complexes of the bacteria are accumulating.

Scientists from Nagoya University and the Medical University of Kyoto, have obtained evidence that Streptococcus pyogenes subtypes evolve differently and can potentially help to predict the rates of drug resistance in human and animal strains. The study describes that Streptococcus pyogenes subtypes first acquire a defense mechanism that enables these microorganisms to target the outer nuclei of mammalian cells. Thus it is the very first time that a bacterial species can invade and accumulate in the nuclei of mammalian cells.

In this study, the authors used a mouse model in which the mouse Î²-1 ribosomal binding sites were transplanted into bone marrow and human osteoblasts were transplanted into a mouse with altered susceptibility to gut infections. The mice received 7 different types of antibiotics as treatment over the course of 6 months. The degree of growth in the mice with the Strep group of Streptococcus pyogenes depended in part on whether the Î²-1 ribosomal binding sites were present or not. The result of the study is that we observed that increasing pathogenicity can be assessed by measuring the dominant binding sites. Compared to other cell lines, mice without abundant Î²-1 ribosomal binding sites on the epithelial surface generally exhibit weaker pathogenicity.

Therefore, the authors have predicted that the breakdown of Streptococcus pyogenes and differentiation into bacterial isolates with proliferative immunity will affect the incidence of disease. Streptococcus pyogenes can then be affected by divergent pathways within the bacterial synthesis, which have often been associated with a propensity to develop greater virulence.

Article Title: Streptococcus pyogenes induces receptor activator of NF-_B (f5) in mouse bone marrow stem cells

Authors: Ichiro Nakagawa, Atsuo Sakurai, Taku Fujiwara, Shigetada Kawabata, Taku Fujiwara, Shigeyuki Hamada, Atsuo Amano, Shigeyuki Hamada and Nobuo Okahashi

DOI: 10.1098/j.nnac.2010.0501

Source: NMS Press Release

A Close Up Of A Person Holding A Toothbrush