v. Objectives of the Project

*Staphylococcus aureus* is well recognized as a significant pathogen in both humans and animals. *S. aureus* strains produce penicillinases and thus β-lactum antibiotics such as methicillin, which are resistant to penicillinases are widely used to treat *S. aureus* infections. During the 1970s, methicillin-resistant *S. aureus* (MRSA) possessing mec A gene emerged as a serious problem in the USA.

In the recent years MRSA has been increasingly reported as an emerging problem in veterinary medicine (Leonard and Markey, 2007). Given the importance of *S. aureus* as a cause of mastitis in cattle and the wide spread usage of intramammary antibiotics in that species, it is perhaps not incorrect to assume that MRSA could be common in bovines. However till date no systematic study on the prevalence of MRSA in bovines has been conducted in India. Several reports have presented information suggesting that animals may serve as reservoirs for MRSA infection of humans (Cuny et al., 2006; Xander et al., 2006 and Kaszanyitzky et al., 2007).

Hence the present project is proposed with the following objectives:

1. To determine the prevalence of MRSA from cases of bovine mastitis in Puducherry.
2. To isolate and identify MRSA from persons in contact with the infected cattle.
3. To determine the genetic relationship between the animal and human isolates.
vi. Likely benefits of the Project:

Several reports have presented information suggesting that animals may serve as reservoirs for MRSA infection to humans. In one case, a dog was implicated as a reservoir for the re-infection of two nurses after their treatment to eliminate carriage of MRSA (Cefai et al., 1994). In another report a cat was implicated as the source of MRSA for nurses in a geriatric nursing facility (Scott et al., 1988). Malik and co-workers (2006) reported that the mec A genes from animal isolates were identical to those found in human MRSA strains and therefore suggested the possibility of zoonotic transfer. Clonal spread and transmission between humans and pigs in Netherlands was demonstrated by Xander et al. (2006). Strommenger et al. (2006) showed that MRSA isolates from pets closely resembled ST22 MRSA, a type widely disseminated in German hospitals. First documented case of direct transmission of MRSA between cows and humans was reported by Kaszanyitzky et al. (2007).

Data regarding the prevalence of Staphylococcal mastitis in Puducherry indicated that approximately 50% of mastitis in cattle is caused by Staphylococci (Amsaveni, 2007). Milk can act as a source of MRSA infection to human beings. However no data on the prevalence of MRSA in cattle in Puducherry is available. In fact no systematic study on MRSA in animals is available from India.

Therefore, the present study will help to analyze the occurrence MRSA in dairy cattle and humans in Puducherry and establish the genetic relationship between the animal and human isolates which will help in understanding whether animals could act as reservoir for MRSA infection of humans. This data can be shared with public health workers and field veterinarians to educate the rural folk about the hygienic practices to be undertaken to prevent the spread of MRSA.
vii. Methodology:

1. Isolation of *S. aureus* from cases of bovine mastitis in Puducherry.
2. Isolation of *S. aureus* from in contact persons (farmers, milk man)
3. Identification of the organism by standard biochemical techniques and also by PCR.
6. The nucleotide sequencing of the amplified PCR products of *mecA* gene and comparison of sequences of animal and human isolates to establish genetic relatedness.