

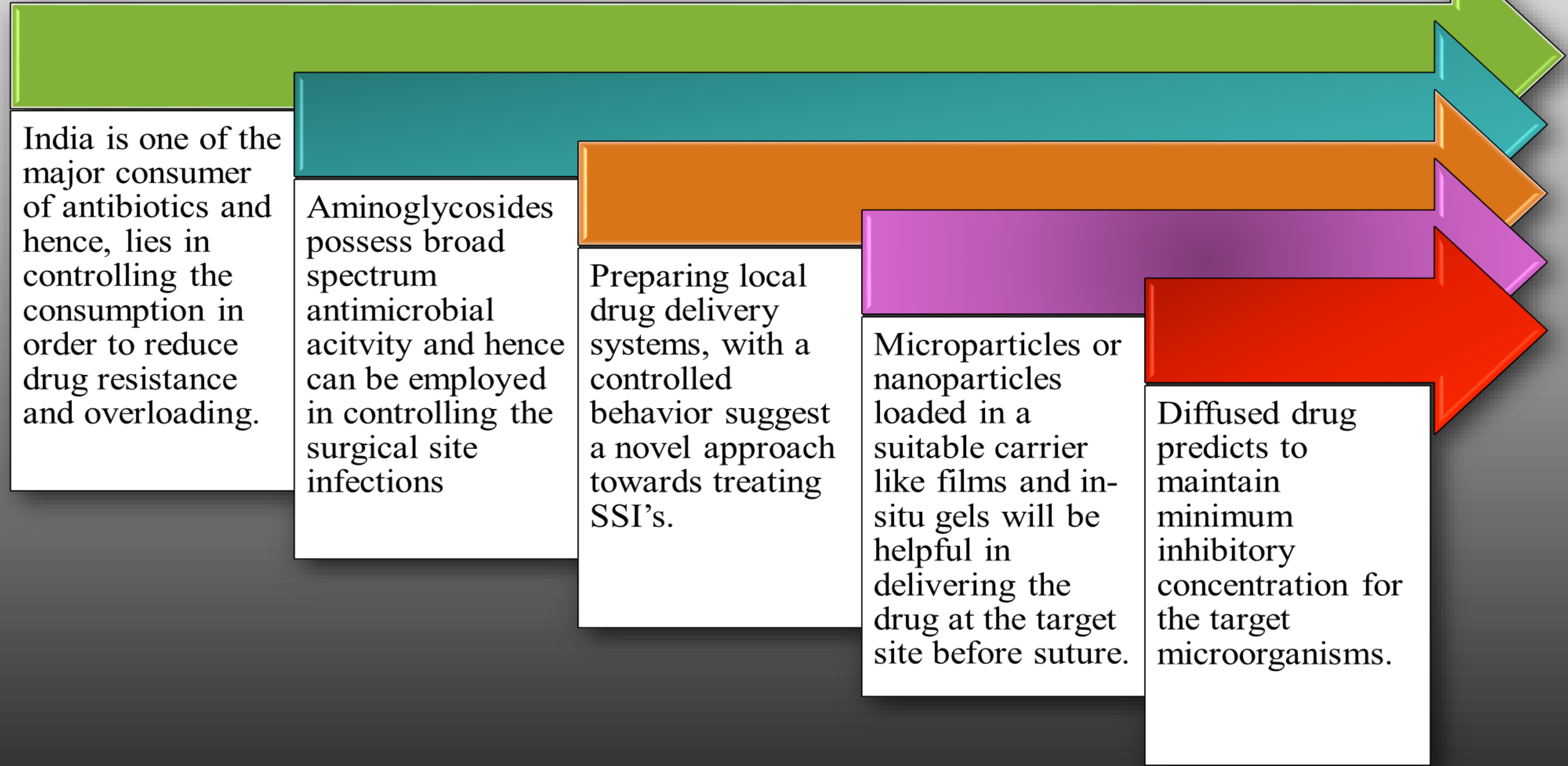
Pathological condition known as surgical site infection (SSI); is the 3rd most common nosocomial infection. The condition is expected to have a morbidity rate of 3% and is majorly accounted to be due to micro-organisms and biofilm formation. Administration of antibiotics is majorly done for treatment in the condition. Centre for Disease Control and Prevention (CDC) commented upon benefits of using IV bolus pre-operative antibiotic therapy followed by oral antibiotics post-operatively. Polymeric microparticles containing antibiotics were developed focusing on switching over to local therapy regimen. The microparticles were prepared using re-emulsification-solvent removal technique. Formulated microparticles were screened for factors affecting the process by Plackett Burman design containing 10 factors each considered at 2 levels. Further optimization was carried out using Box-Behnken design considering 3 factors each at 2 levels. The microparticles were characterized using UV-VIS spectrophotometry (encapsulation profile and drug loading), drug release from microparticles (in-vitro evaluation) and dynamic light scattering (DLS) technique. Further acceptability in terms of administration safety will be evaluated with the help of gas chromatography studies.

INTRODUCTION

- A surgical site infection (SSI) is a pathological condition that occurs after surgery
- It accounts for 3rd most common nosocomial infection and more than 15 million cases per year in USA
- The nosocomial infection may be superficial or associated with the implants
- Micro-organisms and biofilm is the major cause of SSI
- Different micro-organisms such as *E. Coli*, *S. Aureus*, *P. Aeruginosa*, *Corynebacterium* and *Methicillin resistant S. Aureus* have been reported with conditions of SSI.
- Although advancements have been made in infection control practice through improved ventilation, sterilization procedures, obstacles, surgical procedures and prophylactic antibiotics; SSIs remain a substantial cause with morbidity rate of 3%
- Centre for Disease Control and Prevention has commented upon the importance of preparation of patient before surgical procedure and care to be taken during and after the surgeries
- Intra-operative and post-operative care are contributing factors in relation to incidence of SSI

CONTROL OF SSI

- It was shown that antibiotics administered before the surgical procedures decrease incidence of SSI
- Oral anti biotics post surgical procedure such as: Gentamicin, Vancomycin, Metronidazole etc can be used
- Collagen implant containing gentamicin has proved beneficial for the treatment of SSI and its incidence
- Researchers have found that 80% reduction in incidence of SSI was seen with patients undergoing cardiac surgery
- Intra-cranial cefazolin after cataract surgery reduce the SSI to 0.011%
- Novel approaches to the field as controlled release mediated local delivery of anti-microbial
- Mucoadhesive carriers such as films or in-situ gel system might be beneficial carriers of microparticles



TARGETING LOCAL RECEPTORS FOR SURGICAL SITE INFECTION

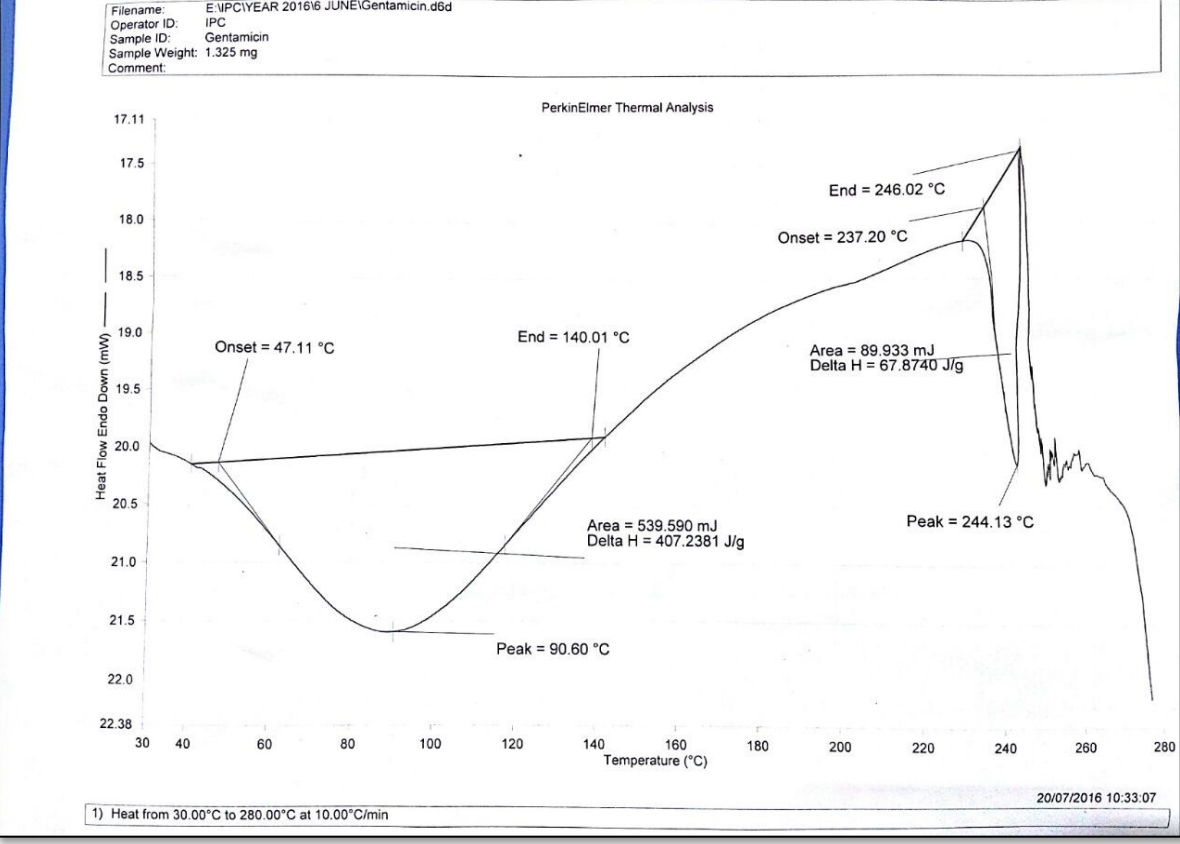
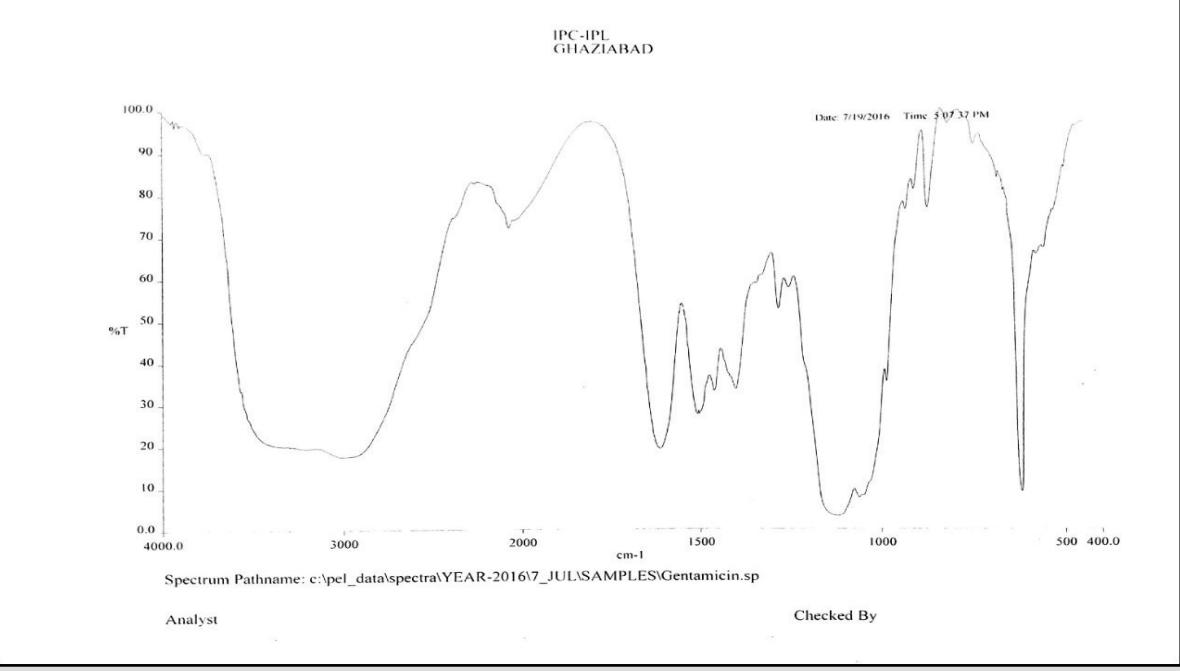
Chetan Dhal*, Renuka Mishra

Institute of Pharmacy, Nirma University, Ahmedabad, Gujarat
15ftphdp37@nirmauni.ac.in



CHARACTERIZATION OF DRUG

S.NO	PERFORMED TEST	OBSERVATION	LIMITS AND RESULTS
1	Determination of % water content	12.97%	Less than 15% (REF IP 2014) Pass
2	DSC melting point	162.91 °C	210—235 °C
3	FT-IR spectral Scan	Shows a vibrational band for Phenoloc compound, Ketone, amino acids, alkanes and benzene ring	Stretching near reigon of Phenolics, Ketone and amino groups



Mettler Toledo V50 2.0.1 New Release / Compact Titration		Serial No. 1207202
Method: JPL01	WATER KF	7/19/2016 1:09:05 PM
Start time: 7/19/2016 1:09:05 PM		
Raw data		
Sample No. J1	Batch No.: 1207202	Sample weight: 0.0618 g
Concentration: 0.0618 g	Formula: KF stand	Weight: 0.0618 g
Correction factor: 1.0	Density: 1.0	Correction factor: 1.0
Moisture time: 60 s	DRIFTV: -23.2 µV/min	DRIFTV: -4.8 µV/min
Temperature: 25.0 °C	T: 25.0 °C	7/19/2016 1:09:05 PM
Sample start: 7/19/2016 1:09:05 PM	Sample end: 7/19/2016 1:12:53 PM	
KF Determination		
Titration: KF 1 comp 5	Conc: 4.8242 mg/mL	
Sensor: EP	Start potential: 94.4 mV	1.57500 mL
Consumption: EP	TEQ: 25.0 °C	6627.714 µg
Termination at: 4.27 min		
Calculation		
Result: R1 = 12.9711 % Content		
Formula: R1 = (VEQ * CONC) * TIME * DRIFTV / 10000 * C		
Constant: C = 0.1		
Duration: R2 = 0.028 mL Consumption		
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