

# وهزارهتی خویندنی بالا و تویزینهوهی زانستی Ministry of Higher Education & Scientific Research

PhD Research Proposal	پرۆپۆزەلى توێژينەوە بۆ بەدەستھێنانى بروانامەى دكتۆرا
1. Title of PhD research	ناونیشانی پرۆپۆزەلی تۆێژینەوەی پێشنیازكراو
proposal	

مهاباد محسن

In vitro and In vivo Assessment Infection Control of Some Multi drug Resistance Gram Positive Bacteria by Using Some Biosynthesis Nanoparticles .

2. Gen	eral information	زانیاری گشتی
Name and surname	Khadija Khalil Mustafa	ناوی سیانی سهر پهرشتیار 1
of the supervisor 1		·
Scientific title	Professor	پلەي زانستى سەرپەرشتيار 1
E-mail	Khadija.mustafa@su.edu.krd	ئیم <u>ن</u> لی سمرپمرشتیار 1 ژمارهی م <u>قبایل</u>
Mobile	07504451181	ژمارهی م <u>ۆبایل</u>
Department	Biology	ناوی بهشی زانستی
College / faculty	Education	كۆلىژ / فاكەڭتى/سكول
university's name	Salahaddin	ناوی زانکوی میلاکی سمرپمرشتیار
Name and surname	Payman Akram Hamasaeed	ناوی سیانی سهر پهرشتیار 2
of the supervisor		(ئەگەر ھەيە)
2( If it is available)		
Scientific title	Professor	پلەي زانستى سەرپەرشتيارى 2
E-mail	Payman.hamasaeed@su.edu.krd	ئیمیّلی سەرپەرشتیار 2
Mobile	07504531839	ر مارهی مقربایل
Department	Biology	ناوی بهشی زانستی
College / faculty	Education	كۆلىر / فاكەڭلتى/سكول
university's name	Salahaddin	ناوى زانكۆ

## 3. Summary (Abstract)

This should be not more than 200 words and not less than 75 words.

ئەبستراكتى توپر ينەوەي بېشنياز كراو. لە 200 ووشە زياتر نەبېت و لە 75 ووشە كەمتر نەبېت.

Isolation and identification of Gram positive bacteria from different clinical sources by using manual methods including morphological, cultural and biochemical tests, then confirmed by Molecular study by using polymerase chain reaction and by using 16srRNA gen and sequencing. Studding the effect of different antimicrobials against isolated bacteria. Studding the relationships between bacterial infection sex, age, type of specimen and treatment . Studding some virulence enzyme of isolated bacteria such as DNase , lipase, gelatinase, urease, protease, beta lactamase, Extended Spectrum \( \beta\)-Lactamase (ESBL) ...etc. Also detection of biofilm in isolated bacteria by using different methods. Biosynthesis of some nanoparticles and then studding the effect of these nanoparticles on the Gram positive bacterial growth in vitro and in vivo by using the rats and also studding some immunologically

يشهكى 4. Introduction

To be completed by the primary supervisor: an overview of the proposed research project, focusing on the background of the project and rationale for the research.

Injuries are causing considerable morbidity and mortality in many parts of the world, particularly in the low and middle income countries, even in developed countries, more than 2 million individuals annually are require medical treatment. However, the structure of the etiologic agents of wound infection in each hospital varies considerably and cannot be predicted exactly. One of the most disconcerting facts about the bacteria is their increasing antimicrobial resistance. The Gram-positive such as bacteria like Streptococcus species, Enterococci species and Staphylococcus species being the most common pathogen

Nanoscience and nanotechnology has attracted a great interest over the last few years due to its potential impact on many scientific areas such as energy, medicine, pharmaceutical industries, electronics, and space industries. This technology deals with small structures and small-sized materials of dimensions in the range of few nanometers to less than 100 nanometers. Nanoparticles (NPs) show unique and considerably changed chemical, physical, and biological properties compared to bulk of the same chemical composition, due to their high surface-to-volume ratio. NPs exhibit size and shape-dependent properties which are of interest for applications ranging from biosensing and catalysts to optics, antimicrobial activity .These particles also have many applications in different fields such as medical imaging, nanocomposites, filters, drug delivery, and hyperthermia of tumors .

## 5. Research objectives

Clarify the research objectives and planned methodology to meet the challenges of the project. Include details of the research plan and relate to the previous work carried out by others.

لیّرهدا سهرپهرشتیار دهبیّت ئامانجهکانی تویّرْینهوهکه روونبکاتهوه و باس له میتوّدهکانی رووبهرووبوونهوهی ئهو تهحهدیاتانه دهکات که لهکاتی تویّرْینهوهدا دیّته ریّگای، همروهها گرنگه که پلانی تویّرْینهوهکه ببهستیّتهوه بهو کارانهی که پیشتر لهو بوارهدا ئهنجام دراون.

The aim of the present study was to analyze the isolation, identification of GP bacteria ,molecular study and antimicrobial resistance patterns of isolated bacteria. Detection some virulence enzymes, detection of biofilm producer. finally Biosynthesis of some nanoparticles and then studding the effect of these nanoparticles on the Gram positive bacterial growth in vitro and in vivo by using the rats and also studding some immunologically parameters .

## 6. Methodology and data collection

In this section the supervisor should describe the methodology of the proposed research

لنر مدا سهر بهر شتیار باس له میتوده کانی ئهنجامدانی تو نز بنه و هکه و شنوازی کو کر دنه و می داتاکان دهکات.

#### **Materials and Methods**

### **Samples**

Clinical specimens will be collect from patients attending to different Hospitals in Erbil city. All Gram positive bacterial isolates are identify depending on morphological, cultural, biochemical tests and PCR by using specific gen 16srRNA.

## Antibacterial susceptibility testing

Antimicrobial susceptibility testing are perform for all GP bacteria by using the standard Kirby-Bauer disk diffusion methods.

#### **B-Lactamase and ESBL detection**

All GPB species are screen for ESBL enzyme production by the following methods: ESBL detection is carry out by standard disk diffusion methods for all isolates according to the standard institute of antimicrobial susceptibility testing.

**Protease assay**: Protease activity are perform by spreading isolates on nutrient agar containing 10% skim milk, after incubation for up to 24 h at 37°C, protease production are shown by the formation of a clear zone cause by casein degradation.

DNase assay: extracellular nucleases (DNases) are determine on DNase agar plates.

**Phospholipase assay**: overnight cultures of isolated bacteria screen for their extracellular phospholipase activity by growing them on egg yolk agar .

**Haemolysin assay**: Haemolysin production are determine using blood agar plates and also cell free haemolytic method .

**Slime test**: brain heart infusion agar plates are prepare containing 0.8 g/l Congo red, isolates are inoculate onto the surface of the medium and the plates are incubate at 30°C for 24 h. Bacteria producing slime appear as black colonies, whereas, non-slime producers remain non pigmented.

#### **Biofilm formation detection**

All bacteria will be test by for the detection of biofilm formation by using different method such as microtiter plate and congo red agar.

## Polymerase Chain Reaction (PCR) and sequencing

DNA extraction is perform as recommend by the manufacturer of . PCR reaction mixtures , PCR condition , program ,agaros gel preparation and gel electrophoresis and then sequenced.

# **Biosynthesis of Nanoparticles**

Biosynthesis of some natural nanoparticles and then studding the effect of these nanoparticles on Gram positive bacterial growth in vitro and then in vivo by using the experimental animals such as rats.

# Immunologically parameters

Finally studding of some immunologically parameters depending on isolated Gram positive bacteria.

## 7. Scope and limit to the research

Details of anticipated problems and proposed resolutions

لێر ددا باس لمو بمربهستانه دهکرێت که دهشێت بێنه ڕێگای ئهنجامدانی توێڗٝينموهکه، همروهها باس له چار هسمری ئمو بهر بهستانهش دهکرێت.

#### 8. Duration and timeline

لير مدا باس له كاتى بيويست بو ئەنجامدانى تويزينهومكه دەكريت

1 year

#### 9. Conclusions

The project supervisor summaries the research objectives and clarify their expected findings; include why the research has scientific value.

لیر ددا سم په شتیار باس له گرنگی ئامانج و دهرئهنجامه چاو در و انکر او مکانی تویز ینه و هکه دهکات، هم و و ها روونی دهکاته و ه کاته و همیه به کاته و همیه به کاته و که بوچی ئاکامه کانی ئهم تویز ینه و ده به های زانستیی همیه به کاته و که بوچی کاکامه کانی نام تویز بنه و ده کاته و کاته و

In Kurdistan region there is little is known about the Gram negative bacteria which isolated from different types of injuries and effect of natural nanoparticles to control the infections caused by these multi drug Gram negative bacteria.

10. References

1. Bhattacharya D. and R. K. Gupta, "Nanotechnology and potential of microorganisms," *Critical Reviews in Biotechnology*, vol. 25, no. 4, pp. 199–204, 2005.

2. Goodsell D.,	, Bionanotechnology:	Lessons from Nature,	Willey-Less, New	Jersey, NJ, USA,
2004.				

- 3. Paull R., J. Wolfe, P. Hébert, and M. Sinkula, "Investing in nanotechnology," Nature Biotechnology, vol. 21, no. 10, pp. 1144–1147, 2003. View at:
- 4. Salata O. V., "Applications of nanoparticles in biology and medicine," Journal of Nanobiotechnology, vol. 2, no. 1, article 3, 2004.
- 5. Bekele, A. Z., Gokulan, K., Williams, K. M., and Khare, S. (). Dose and size-dependent antiviral effects of silver nanoparticles on feline calicivirus, a human norovirus surrogate. Foodborne Pathog. Dis. 2016; 13, 239-244. doi: 10.1089/fpd.2015.2054

11. General notes:

ههر زانیارپیهکی گشتی دیکه که سهریهرشتیار به گرنگی بزانیّت

12.

پەسەندكردنى پرۆپۆزەل لە لايەن لىژنەى زانستى بەش

ژمارهی کۆنووسی کۆبوونهوه: رێٟڮڡۅتي كۆبوونەوە: پەسەند نىلا

ناوی سبانی و واژووی لبژنمی زانستی بهش

ناوی سەر ۆکى لىز نەی زانستى بەش

ناوى سەرۆكى بەش:

**13.** 

پەسىەندكردنى پرۆپۆزەل لە لايەن ئەنجومەنى كۆلىز/فاكەلتى

مۆرى بەش

	پەسەند نە	ژمارهی کۆنوسی کۆبوونهوه: ریکهوتی کۆبوونهوه: بریار: پهسهند کر
مۆرى كۆلێژ		واژوو: ناو راگری کۆلێژ:

تنبینی: تکایه فورمه که ته نها به یه نه زمان (زمانی تویزینه وه) پر بکریته وه.