Department of Medical Microbiology and Immunology
Faculty of Medicine, Minia University
Research Plan (2021-2025)

Department of Microbiology and Immunology is the leader in the study of infectious diseases and immunological basis of diseases. Our department performed many research studies over the past years on different infectious and immunological diseases with valuable output results that gave a proper idea on prevalence, causes, diagnosis and treatment of many diseases which subsequently played an important role in the medical field.

Our research field in Microbiology and Immunology department is subdivided into 2 main subdivisions:

1- Microbiology: is the science concerned with study of different infectious agents as Bacteria, Viruses, and fungi.
2- Immunology: is the science concerned with the study of the Immune system, Immunological diseases and Immunological applications in the medical field as immunodiagnosis, immunotherapy and immunoprophylaxis.

رؤية ورسالة القسم:

الرؤية

التميز في التعليمي والبحثي في مجال الأحياء الدقيقة والمناعة ليواكب المستوى المحلي والدولي ويسهم بدور فعال في حل المشكلات الصحية المجتمعية

الرسالة

يلتزم قسم الميكروبيولوجي والمناعة بإعداد طلاب متميزين لمرحلتي البكالوريوس والدراسات العليا في مجال الأحياء الدقيقة والمناعة قادرين علي المنافسة المحلية في مجال البحث العلمي والاتصال الفعال والعمل الجماعي واستخدام الأجهزة المعملية الحديثة بما يساهم في تحقيق معايير الجودة وتقديم حلول مبتكرة لمشكلات الامراض المعدية بالمجتمع

فريق اعداد الخطة:

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ط|سحر شعبان حسين

خامسا:آلية اعداد الخطة البحثية:

١-الاطلاع علي الخطة البحثية السابقة.

٢-الاطلاع علي الخطة البحثية للجامعة.

٣-استبيان اعضاء هيئة التدريس في الخطة البحثية ومقترحاتهم.

٤-عرض مقترح الخطة علي اعضاء القسم لابداء آرائهم ومقترحاتهم.

٥- اعتماد الخطة البحثية بمجلس القسم.

- **The research plan of our department for post graduate studies include the following projects:**

1- **Covid-19 virus research.**
2- **Establishment of a tissue culture lab for viral and chemotherapy researches.**
3- **Infection control to common infectious microorganisms.**
4- **Hepatitis C virus infection evaluation.**
5- **Cancer Immunology and molecular biology.**
6- **Antimicrobial resistance, including sensitivity testing and molecular study of origin of resistance.**

Covid-19 virus Research

- **Introduction:**

Coronavirus disease (**COVID-19**) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The first case was identified in Wuhan, China, in December 2019. It has since spread worldwide, leading to an ongoing pandemic.

- **Objectives:**

1- Study the prevalence of Covid-19 infection among Egyptians and high-risk groups.
2- Identification of the most common genotypes of the virus and immunological responses to Covid-19 infection.
3- Study of different methods of screening and diagnosis of Covid-19 infection.
4- Study effectiveness of different treatment strategies on Egyptians.
5- Study of possible correlation between viral genotypes and clinical outcome.
6- Study a new trial to offer vaccination against Covid-19.
7- Achieving a proper infection control strategy for prevention of Covid-19 infection.

- **Materials and Methods**:

1- Different clinical samples including blood samples and nasopharyngeal swabs.
2- Different laboratory methods will be performed such as real-time PCR.

Hepatitis C virus infection

- **Introduction:**

Hepatitis C virus (HCV) infection has become a nationally increasing problem in Egypt reaching 14.7% of adult population (Guerra et al,

2012). HCV infection is exerting a progressive burden on health of Egyptians affecting the social and economic life.

- **Objectives:**

  1-Study the prevalence of HCV infection among Egyptians and high risk groups.

  2-Identification of the most common genotypes of the virus

  3-Study of different methods of screening and diagnosis of HCV infection.

  4-Study effectiveness of different treatment strategies on Egyptians.

  5-Study of Hepatocellular carcinoma.

  6-Study a new trial to offer vaccination against HCV.

  7-Achieving a proper infection control strategy for prevention of HCV infection.

- **Materials and Methods**:

  1-Different clinical samples including blood samples and liver biopsies.

  2-Different laboratory methods will be perfomed.

Cancer Immunology

- **Introduction:**

Cancer is a destructive health problem that disturbs the life of many patients all over the world and is well known common cause of deaths all over the world. Many of tumors have an immunological base of existence

and immunological methods can play a role in their diagnosis and management.

- **Objectives:**
  1- Study and Identification of the most common tumors in Egypt and their prevalence.
  2- Study the Immunological Basis for different tumors.
  3- Study of different methods of screening and diagnosis of tumors
  4- Study effectiveness of different treatment strategies of immunotherapy.

- **Materials and Methods**:
  1-Different clinical samples including blood samples and tumor biopsies.
  2-Different laboratory methods will be performed.

- **Expected results:**
  1- Identification of the real prevalence of different tumors.

2- Identification of the proper method for Diagnosis and treatment.

A detailed report about the previous research plan (2015-2020)

Objectives of plan 2015-2020	Achievement form	Form title
1-HCV researches	Master thesis MD thesis Published paper	**Impact of microRNA on response to therapy in chronic hepatitis C genotype 4 patients in Minia governorate**. Safaa S., Hazem A., Mona A., Mohammed S., Rasha M. Kotb DN, Esmail MA, Abdelwahab SF, Abdel-hamid M. Correlation between hepatitis C viral load and hepatitis C core antigenemia among Egyptians. East Mediterr Health J.2017 Jun 14. Polymorphism in selected cytokines and risk of hepatocellular carcinoma in Egypt. Marian R., Mohammed A., Mohammed S., Noha A.

2- Highly infectious microorganisms	Master thesis MD thesis Published paper	**Prevelance of carbapenem resistant *klebsiella pneumoniae* among hospital acquired infection in Minia hospitals. Raghda R., Mahmoud Sh., Mona A., Rasha M.** Evaluation of Methicillin and Vancomycin resistance among clinical isolates of *Staphylococcus aureus*. Alaa Ib., Rasha M., Wedad M., Shaimaa H. **Detection and Characterization of Helicobacter pylori in Patients Undergoing Upper Gastrointestinal Endoscopy and its Relation to Regulatory B cells. Sahar Sh., Noha A., Mohammed A., Soha s.** **HCV, HBV and HIV infection among Egyptian prisoners. Mohammed S., Wael A., J of infection and public health**
3- Emerging antimicrobial resistance	Master thesis Master thesis MD thesis Published paper	Evaluation of Methicillin and Vancomycin resistance among clinical isolates of *Staphylococcus aureus*. Alaa Ib., Rasha M., Wedad M., Shaimaa H. **Antimicrobial susceptibility patterns of hospital acquired infection by *Enterococcus faecalis* and *Enterococcus faecium* at El-Minia Governorate. Aya N., Mahmoud Sh., Mona A., Rasha M.**

		Prevelance of carbapenem resistant *klebsiella pneumoniae* among hospital acquired infection in Minia hospitals. Raghda R., Mahmoud Sh., Mona A., Rasha M. **Detection and Characterization of Helicobacter pylori in Patients Undergoing Upper Gastrointestinal Endoscopy and its Relation to Regulatory B cells. Sahar Sh., Noha A., Mohammed A., Soha s.** **Kotb DN, Mahdy WK, Mahmoud MS, Khairy RMM. Impact of co-existence of PMQR genes and QRDR mutations on flouroquinolones resitance in *Enteroacteriaceae* strains isolated from community and hospital acquired UTIs. BMC infect Dis. 2019 Nov 21** **Molecular Epidemiology and mechanisms of high level resistance to Meropenem and Imipenem in *Pseudomonas*. Noha A., Marwa K., Mohammed S., Reham A.. Infections and drug resistance 2020**
4- Infection control and hospital acquired infections	Master thesis Master thesis MD thesis	**Detection Of Biofilm Formation And Related Virulence Genes In Different *Pseudomonas aeruginosa* Clinical Isolates . Alyaa E., Mohammed S., Ebtsam S., Wedad M.**

	Published paper	**Antimicrobial susceptibility patterns of hospital acquired infection by *Enterococcus faecalis* and *Enterococcus faecium* at El-Minia Governorate Aya N., Mahmoud Sh., Mona A., Rasha M.** **Prevelance of carbapenem resistant *klebsiella pneumoniae* among hospital acquired infection in Minia hospitals. Raghda R., Mahmoud Sh., Mona A., Rasha M.** Detection of biofilm formation and assessment of biofilm genes expression in different *Pseudomonas* clinical isolates. Wedad M., Alyaa E., Mohammed S., Ebtisam S. MetaGene 2019 Nov.
5- Infections in immune-compromised patients. Egypt	Master thesis MD thesis Published paper	**Detection Of Biofilm Formation And Related Virulence Genes In Different *Pseudomonas aeruginosa* Clinical Isolates . Alyaa E., Mohammed S., Ebtsam S., Wedad M.** **Kotb DN, Mahdy WK, Mahmoud MS, Khairy RMM. Impact of co-existence of PMQR genes and QRDR mutations on flouroquinolones resitance in Enteroacteriaceae strains isolated from community and hospital acquired UTIs. BMC infect Dis. 2019 Nov 21**

		Prevalence of HPV16 and HPV 18 in cervical cancer in Minia governorate. Mohammed S., Noha A., Ahmed S. Egyptian j of Medical Miccrobiology 2020 Oct. **Invasive fungal infections in critically ill patients still a challenge. Mohammed S., Ashraf M., Sheerin E.,**
7 Infections during pregnancy	Master thesis Journal published paper	**Characterization of Extended Spectrum Beta-Lactamase Producing *Escherichia Coli* Isolated From Pregnant Women with Asymptomatic Bacteriuria in Minia Governorate. Mariam M., Hazem A., Mohammed S., Noha A.**
8-Research of new molecular targets for the development of new treatment strategies	Journal published paper (National journal) MD thesis	**Impact of microRNA on response to therapy in chronic hepatitis C genotype 4 patients in Minia governorate**. Safaa S., Hazem A., Mona A., Mohammed S., Rasha M **Detection and Characterization of Helicobacter pylori in Patients Undergoing Upper Gastrointestinal Endoscopy and its Relation to Regulatory B cells. Sahar Sh., Noha A., Mohammed A., Soha s.**

	Master thesis	Evaluation of Methicillin and Vancomycin resistance among clinical isolates of *Staphylococcus aureus*. Alaa Ib., Rasha M., Wedad M., Shaimaa H.

Detailed time table for the new research plan (2021-2025)

Year	Objectives	Activities	Expected results and output
2021	1- Covid-19 virus research. 2- Antimicrobial resistance, including sensitivity testing and molecular study of origin of resistance.	MD thesis Master thesis Journal published paper	1- Study the prevalence of Covid-19 infection among Egyptians and high-risk groups. 2- Identification of the most common genotypes of the virus and immunological responses to Covid-19 infection. 3- Study of different methods of screening and diagnosis of Covid-19 infection.
2022	1- Covid-19 virus research. 2- Establishment of a tissue culture lab for viral and chemotherapy researches.	MD thesis Journal published paper	1- Study effectiveness of different treatment strategies on Egyptians. 2- Study of possible correlation between viral genotypes and clinical outcome.

	3- Hepatitis C virus infection		3- Study a new trial to offer vaccination against Covid-19. 4- Achieving a proper infection control strategy for prevention of Covid-19 5- **Assessment of biofilm formation, antimicrobial resistance and virulence factors of *Proteus* strains isolated from different clinical samples in Minia hospitals. Marina S., Hazem A., Soha S., Dalia N.**
2023	1- Infection control to common infectious microorganisms. 2- Antimicrobial resistance, including sensitivity testing and molecular study of origin of resistance. 3- Cancer Immunology and	MD thesis Master thesis Journal published paper	1- Study the prevalence of common infections in intensive care units 2- Study antimicrobial resistance in hospital acquired infection and community acquired infections 3- Determine possible alternative antimicrobial treatments for resistant infections 4- Study the possible role of bacteriophages in treating bacterial infections on invitro cultures

	molecular biology.		5- Study prevalence of different infections among cancer patients
2024	1- Cancer Immunology and molecular biology. 2- Hepatitis C virus infection. 3- Infection control to common infectious microorganisms.	MD thesis Master thesis Journal published paper	**1-** Study treatment of different infections among cancer patients **2-** Study cancer cells resistance to immunotherapy **3-** Establishment of new infection control units in the new buildings of Minia university hospitals 4- Study possible molecular targets for genotyping and treatment of HCV infection
2025	1- Hepatitis C virus infection. 2- Infection control to common infectious microorganisms**.** 3- **New molecular targets for treating bacterial and viral infections**	MD thesis Master thesis Journal published paper	. 1- Study possible molecular targets for genotyping and treatment of HCV infection 2- Study the prevalence of new common infections resistant to protocol Antimicrobial treatment 3- Study role of genetic polymorphism in different types

			of cancer cells caused by oncogenic viral infections

رئيس القسم

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