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# Curriculum vitae

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**Professor Dr./Sanaa Mohamed Fahmy Gad El-Rab**

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**2023**

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| <b>Name</b>            | Sanaa Mohamed Fahmy Gad El-Rab                                     |  |
| <b>Nationality</b>     | Egyptian   |  |
| <b>E-mail</b>          | Sanaafahmy@aun.edu.eg  |  |
| <b>Mobile No.</b>      | 00201025475454   |  |
| <b>Major specialty</b> | Microbiology   |  |
| <b>Specialization</b>  | Bacteriology   |  |
| <b>Academic degree</b> | Professor  |  |
| <b>Highest degree</b>  | PhD –Kanazawa university-Japan -2006                               |  |
|                        | MSc of microbiology( bacteriology), Assiut university, Egypt, 2001 |  |
|                        | BSc of microbiology, Assiut university, Egypt, 1994                |  |

### Academic Degrees and Jobs

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| Professor of microbiology, microbiology department, Assiut university (2021-till now)        |
| Associated Professor, Biotechnology department, Taif university, Saudi arabia (2008-2020)    |
| Associated Professor of microbiology, microbiology department, Assiut university (2014-2020) |
| Assistant Professor of microbiology, microbiology department, Assiut university (2008-2014)  |
| Head of biotechnology department, Taif University, Saudi arabia (2010-2015)                  |
| Lecturer of microbiology, microbiology department, Assiut university (2007-2014)             |
| Assistant Lecturer of microbiology, microbiology department, Assiut university (2001-2007)   |
| Demonstrator of microbiology, microbiology department, Assiut university (1995-2001)         |

### Grants and missions

Grant of PhD, Kanazawa University, Japan 2003-2006

### Teaching experiences

#### Courses

|                                     |  |
|-------------------------------------|--|
| Advanced bacteriology               | Master's microbiology, Assiut university                           |
| Medical microbiology                | Diplopic degree of microbiology                                    |
| Microbial metabolism                | Bachelor's Botany and microbiology department                      |
| Bacteriology                        | Bachelor's Botany and microbiology department                      |
| Actinomycetes                       | Bachelor's Botany and microbiology department                      |
| General botany                      | Bachelor's Botany and microbiology department                      |
| Biochemistry                        | Kanazawa university  |
| General microbiology                | Bachelor's biotechnology department, Taif University, Saudi arabia |
| Industrial microbiology             | Bachelor's biotechnology department, Taif University, Saudi arabia |
| Physiology of microbiology          | Bachelor's biology department, Taif University, Saudi arabia       |
| Genetics of microbiology            | Bachelor's biology department, Taif University, Saudi arabia       |
| Products of biotechnology           | Bachelor's biotechnology department, Taif University, Saudi arabia |
| Introduction to biotechnology       | Bachelor's biotechnology department, Taif University, Saudi arabia |
| Petroleum biotechnology             | Bachelor's biotechnology department, Taif University, Saudi arabia |
| Molecular biology of plant diseases | Bachelor's biotechnology department, Taif University, Saudi arabia |
| Microbiology                        | Bachelor's biotechnology department, Taif University, Saudi arabia |
| Biodiversity                        | Bachelor's biotechnology department, Taif University, Saudi arabia |
| Microbial biotechnology             | Bachelor's biotechnology department, Taif University, Saudi arabia |
| Water microbiology                  | Bachelor's biotechnology department, Taif University, Saudi arabia |

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|---------------------------------------|--|
| Microbial plant diseases              | Bachelor's biology department, Taif University, Saudi arabia |
| Mycology                              | Bachelor's biology department, Taif University, Saudi arabia |
| Plant diseases and biological control | Bachelor's biology department, Taif University, Saudi arabia |
| Soil microbiology                     | Bachelor's biology department, Taif University, Saudi arabia |
| microalgae                            | Bachelor's biology department, Taif University, Saudi arabia |

## Publications

### ١- الأبحاث المنشورة في المجلات العالمية

- 1- Hamdy, S. M., Danial, A. W., Halawani, E. M., Shoreit, A. A., Hesham, A. E. L., & El-Rab, S. M. G. (2023). Biofabrication strategy of silver-nanodrug conjugated polyhydroxybutyrate degrading probiotic and its application as a novel wound dressing. *International Journal of Biological Macromolecules*, 126219.
- 2- Aly E Abo-Amer, **Sanaa MF Gad El-Rab**, Eman M Halawani, Ameen M Niaz, Mohammed S Bamaga. 2022. Prevalence and Molecular Characterization of Methicillin-Resistant *Staphylococcus aureus* from Nasal Specimens: Overcoming MRSA with Silver Nanoparticles and Their Applications. *Korean Society for Microbiology and Biotechnology* 32 (12), 1537-1546.
- 3- Shereen M Hamdy, Amal W Danial, **Sanaa MF Gad El-Rab**, Ahmed AM Shoreit, Abd El-Latif Hesham. 2022. Production and optimization of bioplastic (Polyhydroxybutyrate) from *Bacillus cereus* strain SH-02 using response surface methodology. *BMC microbiology* 22 (1), 1-16
- 4- **Sanaa MF Gad El-Rab**, Eman M Halawani, Aly E Abo-Amer, Nadia H Mohamed, Ahlam M Asiri. 2022. Biosynthesis of Silver Nano-Drug by *Bacillus thuringiensis* and Its Potential Application Against Extended-Spectrum  $\beta$ -Lactamase Producing *E. coli*. *Journal of Biobased Materials and Bioenergy* 16 (4), 572-580.
- 5- Amal Adnan Ashour, Mohammed Fareed Felemban, Nayef H Felemban, Enas T Enan, Sakeenabi Basha, Mohamed M Hassan, **Sanaa MF Gad El-Rab**. 2022. Comparison and Advanced Antimicrobial Strategies of Silver and Copper Nanodrug-Loaded Glass Ionomer Cement against Dental Caries Microbes. *Antibiotics* 11 (6), 756
- 6- Amal Adnan Ashour, Nayef H Felemban, Enas T Enan, Sakeenabi Basha, **Sanaa MF Gad El-Rab**. 2022. The Antimicrobial and Synergistic Strategies of Erythromycin Combined Synthesized Chitosan-Silver and Chitosan-Zinc Oxide Nanodrug on Oral Bacteria. *Journal of Biobased Materials and Bioenergy* 16 (3), 408-417.
- 7- Ashour, A.A.; Basha, S.; Felemban, N.H.; Enan, E.T.; Alyamani, A.A.; **Gad El-Rab, S.M.F.** Antimicrobial Efficacy of Glass Ionomer Cement in Incorporation with Biogenic *Zingiber officinale* Capped Silver-Nanobiotic, Chlorhexidine Diacetate and Lyophilized Miswak. *Molecules* 2022, 27, 528.
- 8- Sakeenabi Basha, Amal Adnan Ashour, Nayef H Felemban, Enas T Enan, Mohammed Fareed Felemban, Amal Ahmad Alyamani, **Sanaa Gad El-Rab**.

Antimicrobial and synergistic effects of miswak, nano-silver drug, and chlorhexidine alone and their combinations upon certain oral microbiota.2022. Bulletin of Pharmaceutical Sciences. Assiut Vol. 45, Issue 1, 2022.

9- Danial, A.W.; Hamdy, S.M.; Alrumman, S.A.; **Gad El-Rab, S.M.F.**; Shoreit, A.A.M.; Hesham, A.E.-L. Bioplastic Production by *Bacillus wiedmannii* AS-02 OK576278 Using Different Agricultural Wastes. Microorganisms 2021, 9, 2395.

10- **Sanaa M. F. Gad El-Rab**, Amal A. Ashour, Sakeenabi Basha, Amal Ahmed Alyamani, Nayef H. Felemban and Enas Tawfik Enan. (2021) Well-Orientation Strategy Biosynthesis of Cefuroxime-Silver Nanoantibiotic for Reinforced Biodentine™ and Its Dental Application against *Streptococcus mutans*. Molecules, 26(22): 6832 (1-15).

11- **Sanaa M. F. Gad El-Rab**, Sakeenabi Basha, Amal A. Ashour, Enas Tawfik Enan, Amal Ahmed Alyamani, Nayef H. Felemban (2021) Green Synthesis of Copper Nano-Drug and Its Dental Application upon Periodontal Disease-Causing Microorganisms. Journal of microbiology and biotechnology, 31 (12):1-11

12- **Sanaa M. F. Gad El-Rab**, Eman M. Halawani and Seham S. S. Alzahrani (2021) Biosynthesis of silver nano-drug using *Juniperus excelsa* and its synergistic antibacterial activity against multidrug-resistant bacteria for wound dressing applications. 3 Biotech volume 11, Article number: 255 page 1-16

13- Enan ET, Ashour AA, Basha S, Felemban NH, **Gad El-Rab SMF**. 2021. Antimicrobial activity of biosynthesized silver nanoparticles, amoxicillin, and glass-ionomer cement against *Streptococcus mutans* and *Staphylococcus aureus*. Nanotechnology 32(21), 215101:11pp

14- Fadlallah S, **Gad El-Rab SMF**, Halwani EM. 2020. Innovative Nanoporous Titania Surface with Stabilized Antimicrobial Ag-Nanoparticles via *Salvadora persica* L. Roots (Miswaq) Extract for Dental Applications. BioNanoScience 10 (4), 998-1009.

15- **Sanaa M. F. Gad El-Rab**, Aly E. Abo-Amer, Ahlam M. Asiri. 2020. Biogenic Synthesis of ZnO Nanoparticles and Its Potential Use as Antimicrobial Agent Against Multidrug-Resistant Pathogens. Current Microbiology. <https://doi.org/10.1007/s00284-020-01991-8>

16- Eman M. Halawani, Aziza M. Hassan and **Sanaa M. F. Gad El-Rab**. 2020. Nanoformulation of Biogenic Cefotaxime-Conjugated-Silver Nanoparticles for Enhanced Antibacterial Efficacy Against Multidrug-Resistant Bacteria and Anticancer Studies. International Journal of Nanomedicine 2020:15 1889–1901

17- **Sanaa M. F. Gad El-Rab**, Awatief F.Hifney, Refat Abdel-Basset. 2018. Costless and huge hydrogen yield by manipulation of iron concentrations in the new bacterial strain *Brevibacillus invocatus* SAR grown on algal biomass. International journal of hydrogen energy. Volume 43, Issue 41, 2018, 18896-18907.

18- **Sanaa M. F. Gad El-Rab**, Eman Mohamed Halawani and Aziza M. Hassan. 2018. Formulation ceftriaxone conjugated gold nanoparticles and their medical applications against extended-spectrum

Lactamase producing bacteria and breast cancer. Journal of microbiology and biotechnology. Journ microbiology and biotechnology, 28(9), 1563–1572.

**19-** Shams H. Abdel-Hafez, Adil A. Gobouri, Naif A. Alshanbari, and **Sanaa M. F. Gad El-Rab**. 2018. Synthesis of Novel Vitamin E Containing Sulfa Drug Derivatives and Study Their Anti-bacterial Activity. Medicinal Chemistry Research, 27:2341–2352.

**20-** Mohsen Q, Sahar A Fadlallah, **Sanaa MF Gad El-Rab**, Montaser AA. 2017. Effect of Cu on the Biocorrosion Inhibition of Ni-P coat based on Carbon Steel by the *Pseudomonas aeruginosa* Biofilm. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 8(2):642-650.

**21-** **Sanaa MF Gad El-Rab** Aziza M Hassan and Hala M Abdelmigid. Evaluation of Genotoxicity and Mutagenicity Induced by Crude Oil Contaminated Water Before and After Biodegradation. Research Journal of Pharmaceutical, Biological and Chemical Sciences. 2016, 7(4) 2912-2924.

**22-** Bahobail, A., **Sanaa M. F. Gad El-Rab**, G. A. Amin. Locally Isolated Bacterial Strains with Multiple Degradation Potential Capabilities on Petroleum Hydrocarbon Pollutants. Advances in Microbiology, 2016, 6, 852-866.

**23-** Aziza M. Hassan, **Sanaa M.F. Gad El-Rab** and Hala M. Abdelmigid. Assessment the Biological Impact of Groundwater via Genomic Analysis. International journal of applied and pure science and agriculture.2016, 2(8)

**24-** Sahar A. Fadl-allah, A.A. Montaser, **Sanaa M.F. Gad El-Rab**. Biocorrosion Control of Electroless Ni-Zn-P Coating Based on Carbon Steel by the *Pseudomonas aeruginosa* Biofilm. International Journal of ELECTROCHEMICAL SCIENCE, 11 (2016) 5490 – 5506. (1.469)

**25-** Hala M. Abdelmigid and **Sanaa M.F. Gad El Rab**. Genome Template Stability Variation in Soybean Seedlings irrigated with groundwater through ISSR Marker. Research Journal of Chemistry and Environment.2016, 20 (12).

**26-** Sedky H.A. Hassan, **Sanaa M.F. Gad El-Rab**, Mostafa Rahimnejad, Mostafa Ghasemi, Jin-Ho Joo , Yong Sik-Ok , In S. Kim, Sang-Eun Oh. Electricity generation from rice straw using a microbial fuel cell. International journal of hydrogen energy 39 (2014) 9490. (3.205)

**27-** **Sanaa M.F. Gad El-Rab**, Romany N.N. Abskharon, Sedky H.A. Hassan and -Ahmed A.M. Shoreit. The influence of heavy metals toxicity on the antioxidant enzyme activities of resistant *E. coli* strains isolated from waste water sites. International Journal of Current Microbiology and Applied Sciences, (2013) 2(12): 162-175.

**28-** Hala M. Abdelmigid, Aziza M. Hassan and **Sanaa M.F. Gad El-Rab**. Expression of Metallothionein as a Biomarker in Response to Various Stress Factors in Different Organisms. International Journal of Advanced Research (2014), Volume 2, Issue 10, 683-695.

**29-** Rasha A. Ahmed, Sahar A. Fadl-allah, Nader El-Bagoury, **Sanaa M.F. Gad El-Rab**. Improvement of corrosion resistance and antibacterial effect of NiTi orthopedic materials by chitosan and gold nanoparticles. Applied Surface Science, 292 (2014) 390– 399. (2.711)

**30-** Sahar A.Fadlallah, Nader El-Bagoury, **Sanaa M.F. Gad El-Rab**, Rasha A.Ahmed and Ghaida El-Ousamii. An Overview of Nitinol shape memory alloy: corrosion resistance and antibacterial inhibition for dental application. Journal of Alloys and Compounds 583 (2014) 455-464 (2.999)

**31-** **Sanaa M. F. Gad El-Rab**, Sahar A Fadl-allah, A.A.Montser. Improvement in antibacterial properties of Ti by electrodeposition of biomimetic Ca-P apatite coat on anodized titania. Applied Surface Science, 2012 (261)1-7 (2.112)

**32-** Amany Elkheshen A. and **Sanaa M.F. Gad El-Rab**. (2012). Effect of reducing and protecting agents on size of silver nanoparticles and their anti-bacterial activity. Dera pharma chemical, (4): 53-65.

**33-** Mahmoud S.Y.M., Sanaa M. F. Gad El-Rab, Hussein Nadia. and Shoreit A.A.M. (2010) Antiviral Activity of Latex from *Ficus nitida* Against Plant Viruses. Global Journal of Biotechnology and Biochemistry. 5 (3): 198-205

**34-** Abskharon, R.N.N.; Hassan, S.H.A.; Kabir, M.H.; Abdul Qadir, S.; **Gad El-Rab Sanaa M.F.** and Wang M.H. (2010). The role of antioxidants enzymes of *E. coli* ASU3, a tolerant strain to heavy

metals toxicity, in combating oxidative stress of copper. World Journal of Microbiology and Biotechnology, 26(2): 241-247. (1.46)

**35-** Abskharon, R.N.N.; **Gad El-Rab Sanaa M. F.**; Hassan, S.H.A. and Shoreit, A.A.M. (2009). Reduction of toxic hexavalent chromium by *E. coli*. Global Journal of Biotechnology and Biochemistry. 4(2): 98-103.

**36-** Gabr, R.M.; **Gad El-Rab Sanaa M.F.**; Abskharon, R.N.N.; Hassan, S.H.A. and Shoreit, A.A.M. (2009). Biosorption of hexavalent chromium using biofilm of *E. coli* supported on granulated activated carbon. World Journal of Microbiology and Biotechnology, 25(10):1695-1703. (1.31)

**37-** Abskharon, R.N.N.; Hassan, S.H.A.; **Gad El-Rab Sanaa M.F.** and Shoreit, A.A.M. (2008). Heavy metal resistant of *E. coli* isolated from wastewater sites in Assiut City, Egypt. Bulletin of Environmental Contamination and Toxicology, 81(3):309-15. (0.85)

**38-** Hassan, S.H.A.; Abskharon, R.N.N.; **Gad El-Rab Sanaa M.F.** and Shoreit, A.A.M. (2008). Isolation, characterization of heavy metal resistant strain of *Pseudomonas aeruginosa* isolated from polluted sites in Assiut City, Egypt. Journal of Basic Microbiology, 48:168–176. (1.43)

**39-** **Sanaa M. F. GAD EL-RAB**, Ahmed A SHOREIT and Yoshihiro FUKUMORI (2006). Effects of Cadmium Stress on Growth, Morphology, and Protein Expression in *Rhodobacter capsulatus* B10. Bioscience, Biotechnology, and Biochemistry. Vol. 70 (10): 2394-2402 (1.0)

### Conferences

**1-** **Sanaa M. F. Gad El-Rab.** Attend the activity entitled "Taif antimicrobial resistance and infection control conference 2018. Directorate of health affairs-Taif – Ministry of health, KSA. Held at intercontinental-Taif. Date:13-15/3/2018.

**2-** **Sanaa M. F. Gad El-Rab**, Aziza M Hassan, Hala M Abdelmigid. Biodegradation of crude oil using new bacterial isolate and Evaluation of Genotoxicity. 32<sup>th</sup> meeting of the Saudi Society for the Life Sciences under the title "Human and environmental development in vision 2030- 21-23 Rajab, 1438H 18-20 April, 2017 "

**3-** **Gad El-Rab Sanaa M. F.**; Abskharon, R.N.N.; Hassan, S.H.A. and Shoreit, A.A.M. Biosorption and Removal of Cr (III) Using Biofilm of *E. coli* Supported on Granulated Activated Carbon. The 30<sup>th</sup> meeting of the Saudi biological society, 7-9 /4/2015 (oral presentation), Tabuk-KSA (مقرر جلسة)

**4-** Sahar A. Fadl-allah, Q. Mohsen, **Sanaa M.F Gad El-Rab\***, A.A. Montser & Reem Al-Santali. Microbiologically Influenced Corrosion (MIC): Evaluation the performance of biofilm formed on modified Ni-P/C1018 alloy. The 29<sup>th</sup> Meeting of Saudi Biological Society: Environment and Development in The Gulf Region. 25-27 /4/1435AH, 20-27/2/2014 AD

**5-** **Sanaa M. F. Gad El-Rab**, Awatif Fahmy Hifney, Refat Abdel-Basset. Effect of iron deficiency on the hydrogen production. The 28<sup>th</sup> meeting of the Saudi biological society "Eco-tourism and sustainable development. 28/5-1/6/1434AH, **9-11/4/2013 AD**

**6-** Nader El-Bagouray, Sahar A.Fadl-allah, **Sanna M. F. Gad El-Rab** Rasha Auf and Ghida S.Al-osaimi. Comparison study of electrochemical behavior, Morphology, Mechanical stability and antibacterial properties of Ti and Ni Ti shape memory alloy. International conference of young chemists. Amman-Jordan.8-10/4/2012

**7-** **Sanaa M. F. Gad El-Rab**, Sahar A Fadl-allah, A.A.Montser. Enhancement of Antibacterial Function of Titanium metal by Electro deposition of Ca-P layer. International conference on materials Science and its applications: Development and Innovation, Taif University. KSA. 13-15/2/2012

**8-** Attend the meeting, the twenty-sixth of the Saudi Society for the Life Sciences under the title "Climate change and biodiversity. " In collaboration with the University of Taif and the General Presidency of Meteorology.7-9/6/1432 (10-12/5/2011)

**9-** Alteration of lipopolysaccharide and protein profiles in SDS- PAGE of *Rhodobacter capsulatus* B10 and 37b4 under zinc stress. Envi-workshop on liquid-solid wastes from agricultural and industrial sources. Alexandria 14-20. Alexandria-Egypt. **March (2004).**

**10-** Alteration of lipopolysaccharide and protein profiles in SDS-PAGE of *Rhodobacter capsulatus* B10 and 37b4 under cadmium stress. <sup>11</sup> th International Symposium of Phototrophic prokaryotes. Tokyo-Japan. 24-29. Aug. (2003).

**11-** Cadmium-binding proteins in *Rhodobacter capsulatus* B10 and 37b4. ISPP Barcelona. 26-31. Aug. (2000).

### My thesis

**1- Studies on the effects of cadmium and zinc stress on *Rhodobacter capsulatus* B10.**  
*Ph.D. Thesis Kanazawa University, Japan (Awarded 2006)*

**2- The Behavioural Response of *Rhodobacter capsulatus* B10 and 37b4 to cadmium and zinc toxicity**  
*M.Sc. Thesis, Assiut University, Egypt (Awarded 2001).*

### Supervision - ٣

**1-Biosorption, reduction of toxic chromium and production of some antioxidant enzymes by *E. coli* ASU 7 under stress effect of metal.**

*( Awarded 2008)*

**2-"Antimicrobial susceptibility patterns and molecular characterization of bacteria isolated from shopping carts and ATM, and approach to control them by metal nanoparticles"**

*(Awarded 27-11-2019)*

**3-"Functionalized nanoparticles against bacteria causing food borne illnesses and their applications in food safety".**

*(Awarded 27-10-2019)*

### Patents

براءة اختراع بعنوان:  
Activated amoxicillin-gold nanoparticles for treatment of multi-drug resistant bacteria. **patent No: 6005.**  
The King Abdul Aziz City for Science and Technology (2018).

براءة اختراع بعنوان: سطح تيتانيوم نانوي التركيب مقاوم للبكتيريا والتآكل لزراعة الاسنان  
Antimicrobial and anticorrosion titanium nano-structure surface for dental implants. **patent No: 5274.** The King Abdul Aziz City for Science and Technology (2017).

### Research projects

**1- Microbiology Influence Corrosion (MIC) On the Modified Coated Alloys Crude Oil pipelines in Simulated Sea Water. No, 1994/1433 Funded From Taif University.**

**2- Study of Antibacterial Effect and Corrosion Resistance of Hydroxyapatite (HA) coatings formed electrochemically on Ti-6Al-4V alloy (HA/Ti-6Al-4V) used for Dental implants. No, 1226/1432 Funded From Taif University.**

**3- Antibacterial activity of silver nano-particles, grant No. 1151/1432, Funded From Taif University.**

**4- Study on the differential gene expression of Metallothioneins for phytoremediation improvement in Saudi Arabia.No, Funded From Taif University.**

**5- Evaluation of Genotoxicity and Mutagenicity of Oil-Contaminated Samples from Jeddah petroleum polluted sites before and after bioremediation. grant No, 1435-3535 (1435h) Funded by Taif University.**

- 6- Potentialities of ‘OMICS” Technologies in Groundwater Safety and Risk Assessment in Taif Province. No, 1435-3538 (1435h)Funded by Taif University.
- 7- Biosynthesis of metal nanoparticles and their medical applications against pathogenic bacteria. NO,1-437-5264. Funded by Taif University. (2016).
- 8- **Biosynthesis of metal nanoparticles and their medical application** Funded Yousef Abdullatif Jameel Chair of Prophetic Medicine Application, King Abdulaziz University, Jeddah, Saudi Arabia.2018
- 9- **Production of anti-microbial biomaterials for dental applications.** project NO,1-439-6084. Funded by Taif University. (2018).