

## CURRICULUM VITAE

### Full name

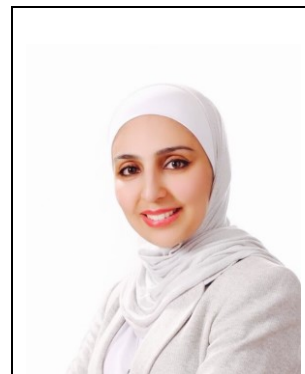
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### 1. Personal Data

Date of Birth: 26<sup>th</sup> of February 1981

Nationality: Jordanian

### 2. Education

Ph.D., Pharmaceutical Sciences (Nanoscience), 2016, The University of Jordan, Amman, Jordan.

M.Sc., Clinical Pharmacy, 2007, The University of Jordan, Amman, Jordan.

B.Sc., Pharmacy, 2003, The University of Jordan, Amman, Jordan.

### 3. Ph.D. Dissertation

Penetration and Distribution of Gold Nanoparticles into Skin: Effect of Nanoparticle Size, Shape and Surface Chemistry on Hair Follicles Targeting and Antibacterial Activity, The University of Jordan, Amman, Jordan. August 2016.



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#### 4. **Employment**

##### *Academic Positions*

Assistant Professor, Department of Pharmacy, Al-Zaytoonah University of Jordan, Amman, Jordan. September 8, 2016 – now.

##### *Administrative Positions*

Not Applicable

#### 5. **Research Interests**

- Nanotechnology and Nanomedicine; nano-bio interface; designing of novel nanomaterials for treatment of skin and cancer diseases.
- Investigating the nan-bio interface by Synchrotron-based analysis techniques.
- Development of novel nanomaterials for transdermal vaccine delivery and dental applications.

#### 6. **Membership in Scientific Societies and Associations**

- American Association for the Advancement of Science (AAAS)
- Jordan Pharmacists Association
- Synchrotron-Light for Experimental Science and Applications in the Middle East (SESAME) Jordanian National Committee (SJNC)

#### 7. **Honors and Awards**

- The **2020** International Rising Talent L'Oréal-UNESCO For Women in Science.
- The **2019** L'Oréal UNESCO For Women in Science Levant fellowship.
- Ali Mango prize for graduate studies **2019**.

#### 8. **Fellowships and Scholarships**



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The **2019** L'Oréal UNESCO For Women in Science Levant fellowship.

## 9. Teaching Experience

### *Undergraduate Courses*

- Pharmaceutics 2
- Pharmaceutics and Pharmaceutical Compounding Lab
- Pharmaceutical Technology
- Pharmaceutical Technology Lab
- Pharmaceutical Communication Skills

## 10. Supervision of Graduate Research

1. Nanofibers material as a potential dressing of wound: development and characterization; *Haneen Qabouq*, **2019/2020**
2. Penetration of Gold Nanoparticles Through Blood Brain Barrier and their Accumulation into The Brain: Effect of Nanoparticles' Shape and Surface Chemistry, *Abdul-Raheem Al-Basha*, **2018/2019**.
3. *In vitro* anti-invasion activity of surface modified gold nanorods against prostate cancer; *Hakam Mohammad Aqabani*, **2018/2019**.
4. Novel gold nanocomposite for wounds healing in rats: effect of nanoparticles' shape and surface chemistry; *Duaa Suliman Abu-Ghaith*, **2017/2018**.

## 11. Grants

1. 02/2020, Novel nano-dressing material for wound healing: A golden hope for diabetic patients, **The 2020 International Rising Talent L'Oréal-UNESCO For Women in Science**.



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2. 09/2019, Gold nanorods conjugated with interleukin-10: a novel dressing nanomaterial for treatment of diabetic wound, **the 2019 L'ORÉAL-UNESCO "For Women in Science Levant program" Fellowship.**
3. 4/2019, Investigating the molecular effects of gold nanoparticles on cancer cell using mass spectroscopy-based metabolite profiling, **The Deanship of Scientific Research and Graduate Studies grant at the University of Jordan.**
4. 4/2019, Evaluation of the biological activity of gold nanoparticles as targeted therapy against different breast cancer subtypes: in vitro testing using cancer cell lines and characterization using mass FTIR and circular dichroism spectroscopy, **The Deanship of Scientific Research and Graduate Studies grant at the University of Jordan.**
5. 07/2019, **Synchrotron-Light for Experimental Science and Applications in the Middle East (SESAME), Jordan.** "Insights into the interaction of gold nanorods with a cationic porphyrin: Synchrotron-based XAFS evidence".
6. 04/2019, **The Deanship of Scientific Research and Graduate Studies grant at Al-Zaytoonah University of Jordan and Helmholtz-Zentrum Berlin fur Materialien und Energie GmbH grants.** "Insights into the Localization and Distribution of Phospholipid-PEG-Decorated Gold Nanorods into MCF-7 Breast Cancer Cells by Cryo Soft X-Ray Nano-Tomography at U41-TXM Beamline".
7. 12/2018, **TWAS-COMSTECH Joint Research Grants, Italy.** "Gold Nanorods Decorated with Phospholipid-Polyethylene glycol as a Novel Platform for Transdermal Vaccination of Tetanus".



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8. 10/2018, **Abdul Hameed Shoman Foundation, Amman- Jordan**. “Evaluation of Melanin-mimetic Polydopamine Nanoparticles for Transdermal Drug Delivery: Effect of Surface Chemistry”.
9. 03/2018, **Scientific Research Support Fund, Amman, Jordan**. “Nanoemulsion- and Gold Nanoparticles Loaded Diclofenac Diethylamine in Bigels: Development, Rheological Characterization”.
10. 01/2018, **Abdul Hameed Shoman Foundation, Amman- Jordan**. “Gold Nanorods Loaded into Gels: Colloidal Stability, Rheological Properties, Photothermal Properties and Penetration extent into Excised Human Skin”.
11. 10/2017, **The Deanship of Scientific Research and Graduate Studies grant at Al-Zaytoonah University of Jordan**. “Interaction of Gold Nanorods-Gel Composite with Human Skin Hair Follicles: The Colloidal Stability and Preferential Targeting”.
12. 10/2017, **The Deanship of Scientific Research and Graduate Studies grant at Al-Zaytoonah University of Jordan**. “The Surface properties of nano-emulsions for drug delivery through skin”.
13. 04/2017, **The Deanship of Scientific Research and Graduate Studies grant at Al-Zaytoonah University of Jordan and Diamond Light Source grant, Oxford, UK**. “Investigating the Penetration and Distribution of Gold Nanorods into the Skin and Hair Follicles of Excised Human Skin as Function of Particle’s Surface Chemistry Using Synchrotron X-Ray Fluorescence (XRF)”.

## 12. Patents

Not Applicable



### **13. Membership of Committees**

#### ***National and International***

1. American Association for the Advancement of Science (AAAS)
2. Pharmaceutical Drug Registration Committee at Jordan Food and Drug Administration (JFDA): member and technical consultant
3. Synchrotron-Light for Experimental Science and Applications in the Middle East (SESAME) Jordanian National Committee (SJNC)

#### ***University***

1. 10/2019-10/2020, The Committee for Scientific Research, a Faculty committee (chair).
2. 10/2017-10/2020, The Committee for Graduate studies, a Faculty committee (member).
3. 10/2019-10/2020, The University Scientific Research Council (member)
4. 10/2018-10/2019, The Committee for Scientific Research, a Faculty committee (member).
5. 10/2017-10/2019, The Committee for Quality Assurance, a Faculty committee (member).
6. 10/2017-10/2018, The University Counsel (member)
7. 10/2017-10/2018, The Committee for Curricular Equivalence and Academic Advisement, Training, and Alumni Follow-up, a Faculty committee (member).



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8. 10/2017-10/2018, The Committee for Extra-Curricular activities and Community Services, a Faculty committee (chair).

#### 14. Professional and Scientific Meetings

##### *Scientific Meetings Organized*

Al-Zaytoonah University of Jordan & The University of Toledo International Pharmaceutical Conference (ZTIPC 2017), Amman, Jordan, 29<sup>th</sup> to 30<sup>th</sup> of November 2017.

Al-Zaytoonah University of Jordan & The University of Toledo International Pharmaceutical Conference (ZTIPC 2019), Amman, Jordan, 6<sup>th</sup> to 7<sup>th</sup> of November 2019.

##### *Participation in Scientific meetings*

1. Intellectual Properties for Educational Institutes Workshop, Ministry of Industry & Trade, Amman, Jordan, March **2019**.
2. Queen's University Belfast - Jordan research symposium and workshop, Al-Ahliyya Amman University, Amman, Jordan, Feb **2019**.
3. 9<sup>th</sup> International Petra School of Physics “Nano Physics: Fundamentals and Applications” Amman, Petra, Jordan, *Attendance*, 9 - 12 Oct **2018**.
4. The 5<sup>th</sup> Middle East Molecular Biology Congress and Exhibition, *Attendance*, Joran 3-6 Oct **2018**.



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5. The 15<sup>th</sup> Synchrotron-Light for Experimental Science and Applications in the Middle East (SESAME) Users Meeting; *Attendance*, Amman, Jordan. Dec **2017**.
6. World Science Forum 2017 Jordan; *Attendance*, Amman, Jordan. Nov **2017**.
7. The 10<sup>th</sup> Scientific Workshop for Synchrotron-Light for Experimental Science and Applications in the Middle East (SESAME) Users: TAIEX Workshop on GEANT H2020 and European Synchrotron Sources; *Attendance*, Amman, Jordan. Aug **2017**.
8. Pharmacy Third Conference “Recent Trends in Postgraduate Research”; *Attendance*, Applied Sciences University, Amman, Jordan. April **2017**.
9. The 10<sup>th</sup> Scientific day, Faculty of Pharmacy and Medical Sciences; *Attendance*, Petra University, Amman, Jordan. April **2017**.
10. “Support to Research, Technological Development and Innovation in Jordan” “SRTD-II”, project; *Attendance*, Amman, Jordan. Feb **2017**.
11. “Gold Nanoparticles”, workshop, The University of Jordan, Amman, Jordan. Dec **2016**.
12. The 13<sup>th</sup> International Conference on X-ray Microscopy; *Attendance*, Oxford University, Oxford, UK. Aug **2016**.
13. “Inductively Coupled Plasma-Optical Emission Spectroscopy”, Workshop, Hamdi Mango Center for Scientific Research (HMCSR), the University of Jordan, Amman. Feb **2015**
14. Diamond Light Source, UK's national synchrotron science facility; *Scientific visit and training*, Oxford, UK. July **2017**.





15. "Test Construction and Analysis of Results", Training course, Al-Zaytoonah University of Jordan, Amman, Jordan. June 2017.

### **15. Participation in or organization of curricular and/or extra-curricular activities**

1. Pharmaceutics and advanced pharmaceutical Technology syllabuses, Oct 2019.
2. Scientific visit with undergraduate students to Dar Al-Dawa Pharmaceutical company, Nov 2017 and May 2018.
3. University's 9<sup>th</sup> Career Day and Career Day for Pharmacy students on 5<sup>th</sup> of May 2017 with the participation of 15 pharmaceutical companies and pharmacies.
4. University's 10<sup>th</sup> Career Day on 24<sup>th</sup> of April 2018.
5. Career Day for 5<sup>th</sup> year students in March 2018 at Al-Zaytoonah University of Jordan.
6. The 1<sup>st</sup> Exhibition for extra-curricular activities at Al-Zaytoonah University of Jordan, 21<sup>th</sup> of March 2017.
7. Several Alumni and medical days and public lectures and presentations held in Al-Zaytoonah University of Jordan campus and other sites.

### **16. Publications**

- Papers in refereed journals



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1. AL\_Nadaf A, Dahabiyeh L, Bardaweel S, **Mahmoud NN**, Jawarneh S. Functionalized Mesoporous Silica Nanoparticles by Lactose and Hydrophilic Polymer as a Hepatocellular Carcinoma Drug Delivery System. *Journal of Drug Delivery Science and Technology* **2020**, 56, 101504.
2. **Mahmoud NN**, Al-Basha A, Hikmat S, Hamadneh L, Zaza R, Shriydeh Z, and Khalil E. Nanoparticles' Size and Chemical Modification have Detrimental Role on the Interaction of Nano Gold with Brain: Extent of Accumulation and Toxicity. *Biomaterials Sciences* **2020** (Just Accepted).
3. **Mahmoud NN**, LM Al-Kharabsheh, EA Khalil, Abu-Dahab R. Interaction of Gold Nanorods with Human Dermal Fibroblasts: Cytotoxicity, Cellular Uptake, and Wound Healing. *Nanomaterials* **2019**, 9(8), 1131.
4. **Mahmoud NN**, Abu-Dahab R, Hamadneh LA, Abuarqoub D, Jafar H, Khalil, EA. Insights into the Cellular Uptake, Cytotoxicity and Cellular Death Modality of Phospholipid-Coated Gold Nanorods Toward Breast Cancer Cell Lines. *Molecular pharmaceutics* **2019**, 16, 4149-4164.
5. Ayyash M, Shehabi A, **Mahmoud NN**, Al Bakri AG. Anti-Biofilm Properties of Triclosan with EDTA or Cranberry as Foley Catheter Lock Solutions. *Journal of applied Microbiology* **2019**, 127 (6), 1876-1888.
6. Al-Bakri A.G; **Mahmoud NN**. Photothermal-Induced Antibacterial Activity of Gold Nanorods Loaded into Polymeric Hydrogel against *Pseudomonas aeruginosa* Biofilm. *Molecules*, **2019**, 24 (14), 2661



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7. Hamed R; Farhan A; Abu-Huwajj R; **Mahmoud NN**. Lidocaine Microemulsion–laden Organogels as Lipid–based Systems for Topical Delivery. *Journal of Pharmaceutical Innovation*, **2019**, 1-14.
8. **Mahmoud NN**, Hikmat S, Abu-Ghith D, Hajjir M, Hamadneh L, Qattan D, Khalil EA. Gold Nanoparticles Loaded into Polymeric Hydrogel for Wound Healing in Rats: Effect of Nanoparticles' Shape and Surface Modification. *International Journal of Pharmaceutics*, **2019**, 565, 174-186.
9. **Mahmoud NN**, Sabbah DS., Abu-Dahab RM, Abuarqoub D, Rashed R, Hasan Ibrahim A, Khalil EA. Cholesterol-Coated Gold Nanorods as an Efficient Nano-Carrier for Chemotherapeutic Delivery and Potential Treatment of Breast Cancer: In Vitro Studies Using MCF-7 Cell Line. *RSC Advances*, **2019**, 9, 12718-12731.
10. **Mahmoud NN**, Alhusban AA, Ali JI, Al-Bakri AG, Hamed R, Khalil EA. Preferential accumulation of phospholipid-PEG and cholesterol-PEG decorated gold nanorods into human skin layers and their photothermal-based antibacterial activity. *Scientific Reports*, **2019**, 9, 5796.
11. Altarawneh O, Madi A, Hamed R, Qirem R, Qerem W, Alhusban A, Sunoqrot S, **Mahmoud NN**, Ata A, and Isheikh I. In vitro Characterization and Evaluation of Commercialized Paracetamol Products in Jordan. *Dissolution Technologies*, **2019**, 26, 1, 36-44.
12. **Mahmoud NN**, Harfouche M, Alkilany AM, Al-Bakri AG, Khalil EA. Correlation between ICP-OES and synchrotron-XRF in detecting the penetration of gold nanorods into excised human skin layers. *Microscopy and Microanalysis*, **2018**, 24, S2, 538-539.



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13. **Mahmoud NN**, Alkilany AM, Khalil EA, Al-Bakri AG. Nano Photothermal ablation effect of Hydrophilic and Hydrophobic Functionalized Gold Nanorods on Staphylococcus aureus and Propionibacterium acnes. *Scientific Reports*, **2018**, 8, Article number: 6881.
14. **Mahmoud, NN**, Harfouche M, Alkilany AM, Al-Bakri AG, El-Qirem RA, Shraim SA, Khalil EA. Synchrotron-based X-ray fluorescence study of gold nanorods and skin elements distribution into excised human skin layers. *Colloids and Surfaces B: Biointerfaces*, **2018**, 165 C, 116-128.
15. **Mahmoud NN**, Alkilany AM, Khalil EA, Al-Bakri AG. Antibacterial activity of gold nanorods against Staphylococcus aureus and Propionibacterium acnes: misinterpretations and artifacts. *International Journal of Nanomedicine*, **2017**, 12, 7311-732.
16. **Mahmoud NN**, Alkilany AM, Dörthe Dietrich, Uwe Karst, Bakri AG. and Khalil, EA. Preferential accumulation of gold nanorods into human skin hair follicles: Effect of nanoparticle surface chemistry. *Journal of Colloids and Interface Science*, **2017**, 503, 95-102.
17. **Mahmoud NN**, Al-Qaoud KM, Al-Bakri AG, Alkilany AM, and Khalil EA. Colloidal stability of gold nanorod solution upon exposure to excised human skin: Effect of surface chemistry and protein adsorption. *The International Journal of Biochemistry & Cell Biology*, **2016**, 75, 223-231.
18. Alkilany AM, **Mahmoud NN**, Hashemi F, Hajipour MJ, Farvadi F, and Mahmoudi M. Misinterpretation in Nanotoxicology: A Personal Perspective. *Chemical Research in Toxicology*, **2016**, 29, 943-948.



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- Books and Book Chapters

Not Applicable

- Conference Presentations

1. **Mahmoud N.N.**, Abu-Dahab R., Hamadneh L.A, Abuarqoub D., Jafar H., Khalil E.A. “Cellular Uptake and Cytotoxicity of Phospholipid-Decorated Gold Nanorods Toward MCF-7 and T47D Breast Cell Cancer Lines”, *Nanotechnology in Cancer: Engineering for Oncology, Poster presentation*, Cambridge, UK: 12 - 14 September **2019**.
2. **Mahmoud, N.N.**, Harfouche, M., Alkilany, A.M., Al-Bakri, Khalil, E.A. “Correlation between ICP-OES and Synchrotron-XRF in Detecting the Penetration of Gold Nanorods into Excised Human Skin Layers”, *The 14<sup>th</sup> International Conference on X-ray Microscopy; Poster presentation*, Saskatoon, Canada. Aug **2018**.
3. **Mahmoud, N.N.** “Application of Synchrotron-XRF in Detection of Gold Nanorods Penetration through Skin Layers”; *Oral presentation- workshop*, School of Pharmacy, The University of Jordan, Amman, Jordan. April **2018**.
4. **Mahmoud, N.N.** “Applications of Prism Program in Scientific Data Analysis and Interpretations”; *Oral presentation- workshop*, School of Pharmacy, The University of Jordan, Amman, Jordan. April **2018**.
5. **Mahmoud, N.N.**, Alkilany, A. M., Dörthe Dietrich, Uwe Karst, Bakri, A. G. and Khalil, E. A. “Preferential Accumulation of Gold Nanorods into Human Skin Hair Follicles: Effect of Nanoparticle Surface Chemistry”; *Oral presentation*, Al-Zaytoonah University of Jordan and The University of Toledo International Pharmaceutical Conference (ZTIPC 2017), Amman, Jordan. Nov **2017**.



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6. **Mahmoud, N.N.**, Alkilany, A. M., Dörthe Dietrich, Uwe Karst, Bakri, A. G. and Khalil, E. A. “Gold Nanoparticles-Skin Interface: Targeting into Hair Follicles”; *Oral presentation*, the Scientific Day, Philadelphia University, Amman, Jordan. May **2017**.
7. **Mahmoud, N.N.**, Alkilany, A.M., Al-Bakri, Khalil, E.A. “Colloidal Stability and Penetration Extent of Gold Nanorods of Different Surface Chemistry Upon contact with Excised Human Skin”; *Poster presentation*, The 4th International Pharmaceutical Conference, The University of Jordan, Amman, Jordan. Oct **2016**.
8. **Mahmoud, N.N.**, Alkilany, A.M., Al-Bakri, Khalil, E.A. “Gold Nanoparticles-Skin Interface: Effect of Nanoparticles Colloidal Stability and Surface Chemistry”; *Oral presentation*, Nano-Tech workshop, The University of Jordan, Amman, Jordan. Oct **2016**.
  - Reports  
Not Applicable