

# Mohammad Mahmoud Farag, Ph.D.

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## EDUCATION

**2010 PhD** in chemistry, Chemistry Department, Faculty of Science, Ain Shams University. Dissertation title: *Bone engineering scaffold designed for sustained antibiotics release.*

**2006 M.Sc.** in chemistry, Chemistry Department, Faculty of Science, Ain Shams. Dissertation title: *Glass-ceramic based on fluorcanasite and fluorrichterite.*

**1999 Bachelor of Science**, Chemistry & Geology Department, Faculty of Science, Cairo University.

## SKILLS

- Synthesis of microspheres for targeted drug delivery.
- Fabrication of bioceramic scaffolds at room temperature using rapid prototyping (RP) technique, utilizing the concept of ceramic cement reactions.
- Injectable ceramic bone cements (calcium phosphates and magnesium phosphates).
- Coating of metal implants by the electrophoretic deposition (EPD) technique with bioceramics such as hydroxyapatite and bioglass.
- Synthesis and characterization of bioactive scaffolds based on bioactive glasses, bioactive glass-ceramics, and composites of biodegradable polymers with bioactive glass for tissue engineering applications, and to serve as a controlled local delivery system for drugs.
- Different types of bioglass-ceramics for dental and biomedical applications.
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## PROFESSIONAL & ACADEMIC POSITIONS

- Nominated for a Fulbright postdoctoral fellowship in 2020 for 9 months
- Visiting scholar: 5 November – 20 November, 2019: Warsaw University of Technology
- Postdoctoral fellowship: 4 April – 4 August, 2019: University of California, Riverside (UCR)
- Visiting scholar: 11 April – 10 May, 2018: Warsaw University of Technology
- Visiting project member: August 5, 2017 – August 16, 2017: University of Strasbourg
- Visiting project member: July 20, 2016 – August 11, 2016: University of Strasbourg
- Postdoctoral fellowship: Dec 15, 2011 – Oct 20, 2013: Korea Institute of Materials Science (KIMS)
- DAAD scholarship: Feb 15 – Aug 15, 2010: University of Jena, Germany
- Mar 2008 – Oct 2010: Graduate Research Assistant (Doctoral research), Biomaterials Department, National Research Centre (NRC)
- Jun 2001 – Nov 2006: Graduate Research Assistant (MS research), Glass Research Department, National Research Centre (NRC)
- Sep 2000 – Jun 2001: Postgraduate Student, Chemistry Department, Faculty of Science, Ain Shams University
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## RESEARCH AND TEACHING ACTIVITIES

### Research Activities

- 1- Supervision: 5 Masters & 6 PhDs
- 2- Reviewer in numerous high-impact journals.

### 3- Projects:

- "Bioactive and antibacterial metal implant composite coatings based on therapeutic ions-doped bioactive glass and biodegradable polymer" 2 years (till 2022), Funded by Academy of Scientific Research & Technology, Egypt.
- "Synthesis of Amphiphilic Porphyrin analogues of Temoporfin with the utility of drug delivery system for Application in Targeted Photodynamic Cancer Therapy". 3 years (till 2022), Funded by the National Research Center, Egypt.
- "Synthesis of tissue engineering hydroxyapatite/bacterial cellulose composites from fully natural wastes" 3 years (till 2022), Funded by National Research Center, Egypt.
- "High-performance glass marble from industrial wastes" 2 years (till 2022) funded by Science and Technology Development Fund, Egypt.
- "Ions-doped mesoporous borate glass used as bone therapies and drug delivery system" 1 year (till 2017), Funded by National Research Center, Egypt.

### Teaching Experience

- Invited Lecturer for "Biomaterials: Types and Application", Training Center, National Research Center, Egypt, Summer 2009, 2017 and 2019.
- Invited Lecturer for "Glass Technology", Training Center, National Research Center, Egypt, Summer 2005.

### Societies

- Egyptian Chemical Society.
- Korean Ceramic Society (KCS).
- Egyptian Society for Science and Technology of Biomaterials (ESSTB)

### Awards

- Scientific Excellence Award from National Research Centre, 2015, for a registered patent in South Korea entitled "The scaffold composition for regeneration of hard tissue having magnesium phosphate, scaffold for regeneration of hard tissue comprising the same and preparation methods thereof".
- Award for the best poster presentation in the Annual meeting of the Korean Ceramic Society, April 19-20, 2013, Changwon, South Korea.

## COMMUNICATIONS & PUBLICATIONS

### Publications: 49 in international journals

#### Selected publications

- [1] Abd El-Hamid H, **Farag MM**, Abdelraof M, Elwan R. Regulation of the antibiotic elution profile from tricalcium phosphate bone cement by addition of bioactive glass. *Scientific Reports* 2024;14:2804.
- [2] **Farag MM**, Ahmed HY, Al-Rashidy ZM. Improving the corrosion resistance of magnesium alloy by magnesium phosphate/glass composite coatings using sol-gel method. *Silicon* 2023;15:3841-54.
- [3] **Farag M**, Al-Rashidy Z. Synergistic effect of cerium and structure directing agent on drug release behavior and kinetics. *Journal of Sol-Gel Science and Technology* 2023;105:430-42.
- [4] **Farag MM**. Recent trends in biomaterials for tissue regeneration applications. *Journal of Materials Science* 2023:1-32.
- [5] **Farag M**, Al-Rashidy Z. Synergistic effect of cerium and structure directing agent on drug release behavior and kinetics. *Journal of Sol-Gel Science and Technology* 2023;105:430-42.
- [6] **Farag MM**, Ahmed HY, Al-Rashidy ZM. Bioactive magnesium phosphate/glass composite coatings for magnesium alloy using sol-gel method. *Silicon*, 2022.
- [7] **Farag MM**, Beherei H, Al-Rashidy ZM, Farag DB, Salem ZA: Dental pulp stem cell viability and osteogenic potential assessment of new Mg-phosphate magnetic bioceramic nanoparticles. *Journal of Materials Research* 2022:1-13.

- [8] A.M. Ibrahim, Z.M. Al-Rashidy, N.A.A. Ghany, H.Y. Ahmed, A.E. Omar, **M.M. Farag**, Bioactive and antibacterial metal implant composite coating based on Ce-doped nanobioactive glass and chitosan by electrophoretic deposition method, *Journal of Materials Research*, (2021) 1-15.
- [9] Z. Al-Rashidy, **M. Farag**, N.A. Ghany, A. Ibrahim, W.I. Abdel-Fattah, Aqueous electrophoretic deposition and corrosion protection of borate glass coatings on 316 L stainless steel for hard tissue fixation, *Surfaces and Interfaces*, 7 (2017) 125-133.

#### Patents

1. Mohamed Sayed Hasanin, Mohamed Abdelraof Mohamed, **Mohammad Mahmoud Farag**: Introducing of nanobioactive glass to improve the production and bioactivity of the bacterial cellulose. Registered in 31-12-2018, Registration no. 2141/2018.
2. Mohamed Sayed Hasanin, Mohamed Abdelraof Mohamed, **Mohammad Mahmoud Farag**: Eco-friendly synthesis of bioactive composites based on bacterial cellulose and magnesium phosphate or its derivative Registered in 21-12-2020, Registration no. 2041/2020.
3. YUN, Hui-suk, **Mohammad Mahmoud Farag**: The scaffold composition for regeneration of hard tissue having magnesium phosphate, scaffolds for regeneration of hard tissue comprising the same and preparation methods thereof. Patent number: 10-1357673, Filing date: 2012-09-03, Registration date: 2014-01-24, Patentee: Korea Institute of Machinery and Materials.
4. YUN, Hui-suk, **Mohammad Mahmoud Farag**: The scaffold composition for regeneration of hard tissue having magnesium phosphate, scaffolds for regeneration of hard tissue comprising the same and preparation methods thereof. Patent number: 10-1562556, Filing date: 2015-02-16, Registration date: 2015-10-16, Patentee: Korea Institute of Machinery and Materials.

#### Books

- **Mohammad Farag**, Abeer El-Kady, Bothaina Abd El-Hady, Bone Engineering Scaffold Designed for Sustained Antibiotics Release. ISBN 978-3-639-76089-7, Scholars' Press, 2015-01-08.
- Translation of a book entitled "Glass-Ceramics" 2<sup>nd</sup> edition by P.W. McMillan (1979), Academic Press, London, from English to Arabic language, under publication. Mohammad M. Farag, Zainab M. Al-Rashidy: Biomaterials for Tissue Regeneration. Advances and Challenges for Fabrication and Clinical Translation. SpringerBriefs in Materials, Ed. S.K. Bhatia, A. Diebold, J. Hu, K. J. Krishnan, D. Narducci, S.S. Ray, G. Wilde. ISBN 978-3-031-75753-2, Printforce, the Netherlands, 2025