

Omid Bafkar, PhD

Senior Mechanical Engineer

Medical Devices · Microfluidics · CFD/FEA · Regulated Product Development

PROFILE

Senior Mechanical Engineer with 10+ years across regulated medical devices, biomedical R&D, microfluidics, simulation, and product development from architecture through verification, design transfer, and manufacturing. Experienced working within ISO 13485 design controls and ISO 14971 risk management, with working familiarity with FDA QMSR / 21 CFR Part 820 and 510(k) expectations. Inventor on U.S. Patent 12,211,209 for patient-specific obstructive sleep apnea prediction and intervention.

CORE ENGINEERING

Product architecture & mechanical design · Microfluidics & fluidic systems · CFD / FEA / FSI · DFM / DFMA · Tolerance analysis · V&V · Design transfer · Cross-functional project execution

REGULATORY & STANDARDS

ISO 13485 · ISO 14971 / DFMEA · FDA QMSR / 21 CFR Part 820 familiarity · 510(k) pathway familiarity · ISO 10993 & ISO 11607 familiarity · IEC 60601-1 training/exposure · ASME Y14 / GD&T · applicable ASTM methods

PROFESSIONAL EXPERIENCE

2025 - Present

Senior Mechanical Engineer

Verathon

- Mechanical development of regulated medical devices from architecture and detailed design through verification and design transfer within ISO 13485 design controls.
- Apply risk-based design, simulation, tolerance analysis, DFM/DFMA, controlled engineering change, and supplier/manufacturing coordination.
- Work across engineering, quality, manufacturing, and supplier interfaces with working familiarity with current FDA QMSR expectations.

2024 - 2025

Senior Mechanical Engineer

Questat

- Led mechanical design, development, and validation activities for biosensor products from concept toward production.
- Coordinated technical decisions across disciplines, balancing performance, manufacturability, verification, schedule, and program risk.

2021 - 2024

Product Development Engineer

SCHOTT Minifab

- Designed and optimized microfluidic cartridges and complex fluidic systems using CFD/FEA, FMEA, verification testing, and manufacturability-driven iteration.
- CFD-led design work supported technical decisions across medical-device programs; design execution contributed to an on-time new-product introduction.
- Worked with internal and external stakeholders through design development, review, testing, and production-readiness activities.

2021

Mechanical Design Engineer

Invetech

- Developed mechanical and electromechanical assemblies, fixtures, and fluidic systems with attention to thermal, structural, and manufacturing performance.

2017 - 2021

R&D Engineer / PhD Researcher

CSIRO · RMIT University

- Developed patient-specific CFD and fluid-structure interaction models of the upper airway using medical-imaging-derived geometry and experimental validation.
- Research contributed to a granted U.S. patent and peer-reviewed Journal of Biomechanics publications; computational work included collaboration with Barcelona Supercomputing Center.



Omid Bafkar, PhD

RESEARCH & IP

U.S. Patent 12,211,209 - Prediction and Intervention of Obstructive Sleep Apnoea
 Granted January 28, 2025 · Assigned to CSIRO · Patient-specific CFD/FSI methodology for upper-airway analysis and treatment planning.
[View patent record](#)

Patient-specific upper-airway CFD / FSI

Dynamic MRI-derived geometry, segmentation, k-omega SST turbulence modeling, FSI coupling at soft-tissue walls, and experimental PTV validation applied to obstructive sleep apnea research.

EDUCATION

PhD, Mechanical & Manufacturing Engineering
 RMIT University · 2017 - 2021
 CFD and fluid-structure interaction applied to the human respiratory system.

Master's, Mechanical & Manufacturing Engineering
 RMIT University · 2014 - 2016

BSc, Mechanical Design
 IAU · 2009 - 2013

Project-management capability
 Stage-gate planning, cross-functional technical reviews, supplier coordination, schedule/risk tracking, verification planning, and design-transfer execution.

SELECTED PUBLICATIONS

Effect of inhalation on oropharynx collapse via flow visualisation
 Journal of Biomechanics, 2021

Impact of sleeping position, gravitational force and effective tissue stiffness on obstructive sleep apnoea
 Journal of Biomechanics, 2020

Globe fixation system for animal eye practice
 Journal of Cataract & Refractive Surgery, Vol. 37, 2011 · industrial design and fabrication contribution

EARLIER BIOMEDICAL EXPERIENCE

Tehran University of Medical Sciences · Dentus Dental & Medical Equipment Company
 Earlier work spanning research assistance, clinician collaboration, CAD, prototyping, testing, and development of medical/dental equipment and surgical-training hardware.

RECOGNITION & CREDENTIALS

Best Student Presentation Award
 RMIT Sleep & Brain Health Symposium · 2018

Erasmus Scholarship
 Barcelona, Spain · 2018

Lean Six Sigma Green Belt
 The Council for Six Sigma Certification (CSSC) · 2020

Project management training
 RMIT University · planning, coordination, schedule/risk tracking, and cross-functional execution