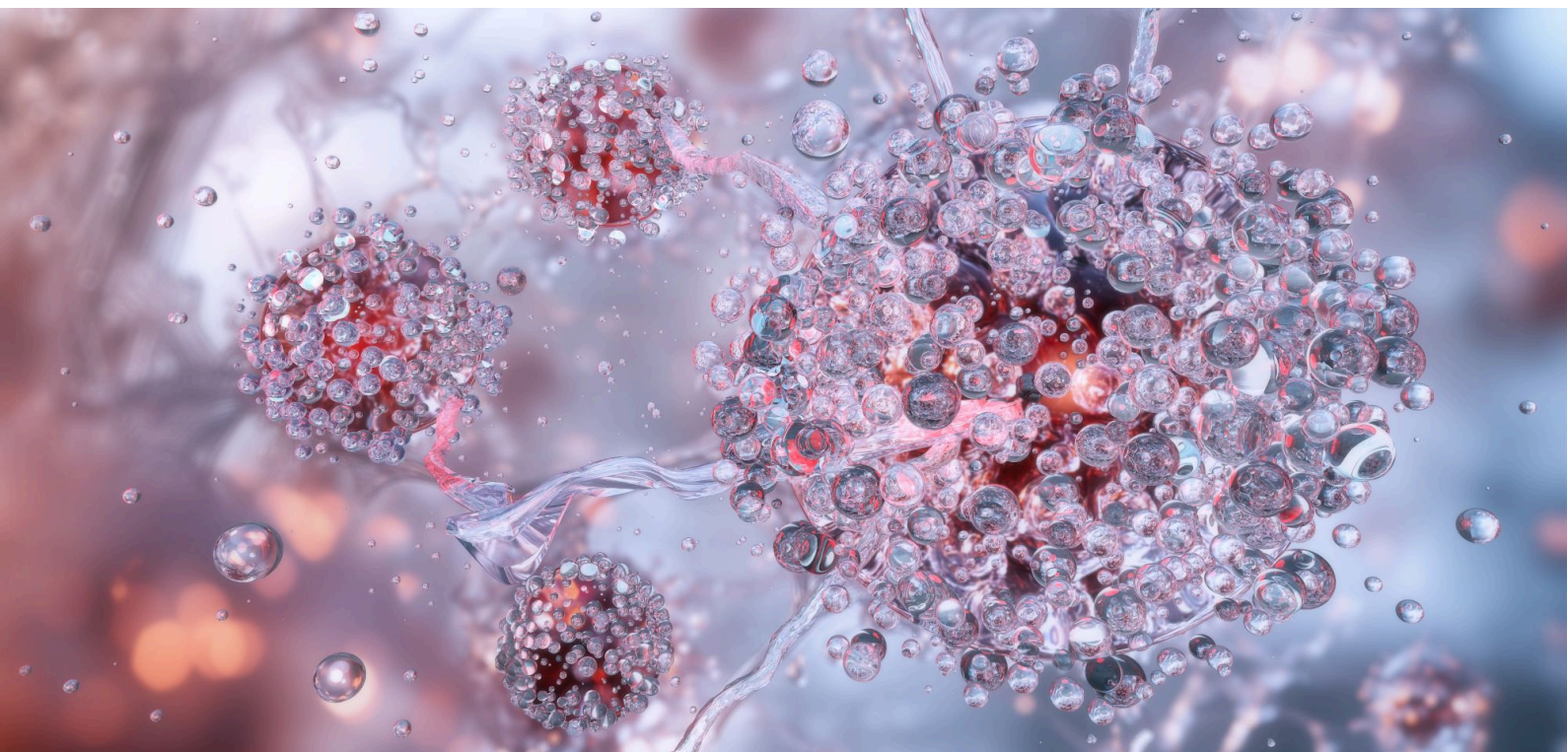




**IPI**  
Academy



*Presented by*  
**Management Forum**

# The Applications of Nanoparticles in the Pharmaceutical and Biomedical Industries

**9-10 July 2025**

**+ 12-13 November 2025, 11-12 March 2026**

Attendees will gain a comprehensive understanding of the science behind nanoparticles, their diverse applications, manufacturing and the opportunities and challenges involved in bringing nanoparticle-based solutions to market.



**Format:**  
Live online



**CPD:**  
12 hours for your records



Certificate of completion

# Course overview

**This course offers an in-depth exploration of the rapidly evolving field of nanoparticle technology and its transformative applications in the pharmaceutical and biomedical industries.** Due to their ability to interact with biological systems at the molecular level, nanoparticles have emerged as powerful tools in drug delivery, diagnostics, and therapeutic innovations. From improving drug solubility and targeted delivery to enabling advanced imaging techniques, nanoparticles are reshaping modern medicine.

Participants will explore the different types of nanoparticles, including liposomes, polymeric nanoparticles, and metallic nanoparticles, and their specific applications in pharmaceutical, medtech and biotech Industries. The course will delve into nanoparticle design, synthesis, and functionalisation and the regulatory and safety considerations involved in their use. Attendees will also examine cutting-edge research and real-world case studies on how nanoparticles enhance drug efficacy, minimise side effects, and develop novel therapeutic solutions.

## Benefits of attending

- **Gain** an introduction to nanoparticles: types, properties and biomedical relevance
- **Understand** nanoparticles in drug delivery: improving solubility, stability and targeting
- **Learn** different applications of nanoparticles in diagnostics and imaging
- **Explore** nanoparticles in controlled and sustained drug release
- **Discuss** regulatory and safety considerations for nanoparticle-based pharmaceuticals
- **Delve** into applications in gene therapy, cancer treatment, and regenerative medicine
- **See** case studies on successful nanoparticle-based drugs and therapies
- **Discover** future trends and innovations in nanoparticle research and development

## Who should attend

This course is designed for professionals involved in pharmaceutical development, biomedical research and medical innovation, including:

- Pharmaceutical scientists and researchers
- Biomedical engineers and researchers
- Drug development professionals
- Regulatory affairs specialists in pharma and biotech
- Nanotechnology researchers and engineers
- Clinical researchers and medical scientists
- R&D managers in the pharmaceutical and biotech industries
- Consultants and advisors in pharmaceutical innovation and nanomedicine

This course is ideal for professionals looking to deepen their understanding of nanoparticle technology, explore its vast potential in drug and therapeutic development and stay at the forefront of pharmaceutical and biomedical advancements.

# Programme

## Overview of nanotechnology

- Introduction to nanotechnology: brief history, definition and significance
- Nanotechnology vs. nanoscience: key differences and their implications in pharmaceutical and biomedical contexts
- Basic nanoparticle concepts: size, shape, surface area and surface charge
- Nanoparticle types: organic (liposomes, dendrimers), inorganic (gold, silver, silica) and hybrid nanoparticles

## Nanoparticle characterisation

- Size and shape characterisation: techniques like Dynamic Light Scattering (DLS), Transmission Electron Microscopy (TEM) and Scanning Electron Microscopy (SEM)
- Surface properties: Zeta potential, surface charge and hydrophobicity/hydrophilicity
- Stability and encapsulation efficiency: methods for assessing nanoparticle stability and drug loading efficiency

## Nanoparticles in drug delivery

- Mechanisms of nanoparticle-based drug delivery: passive targeting (size and EPR effect) vs. active targeting (surface modifications for receptor-mediated targeting)
- Controlled and sustained release: nanoparticles for controlled release, bioavailability enhancement and targeted delivery
- Challenges and opportunities in drug delivery: overcoming biological barriers, such as the blood-brain barrier, immune system evasion and toxicological concerns

## Pharmaceutical applications of nanoparticles

- Nanoparticles for oral drug delivery: enhanced solubility, bioavailability and controlled release
- Injectable nanoparticle systems: liposomes, micelles and polymeric nanoparticles for intravenous drug administration
- Nanoparticles in vaccine delivery: their role in antigen delivery, immune response modulation and vaccine adjuvants

## Nanoparticles in cancer therapy

- Nanoparticle-based cancer therapy: active vs. passive targeting in tumours.
- Therapeutic applications: chemotherapy, photothermal therapy, gene therapy and RNA delivery using nanoparticles
- Nanoparticle-drug conjugates: targeted delivery of cytotoxic drugs and antibodies

## Nanoparticles in diagnostic and imaging techniques

- Nanoparticles in imaging: role in MRI, CT, fluorescence, and PET imaging
- Biosensors and diagnostics: using nanoparticles for early detection of diseases through biosensing technologies
- Nanoparticles for targeted imaging: surface modifications for specific tissue or disease targeting

## Biocompatibility, toxicity and regulatory challenges

- Biocompatibility of nanoparticles: understanding cellular interactions, immune system activation and tissue penetration
- Nanotoxicology: safety concerns regarding nanoparticles in the human body (cytotoxicity, oxidative stress and inflammation)
- Regulatory considerations: current guidelines for nanoparticle-based drug products, challenges in regulatory approval and standardisation

## Future directions and emerging trends

- Nanomedicine and personalised medicine: the role of nanoparticles in tailored therapies
- Nanoparticles in RNA and gene delivery: current advances in CRISPR/Cas9 delivery and mRNA therapeutics
- Sustainability and ethical concerns: biodegradable nanoparticles, environmental impact and ethical considerations in the biomedical use of nanomaterials

# Presenter



## **Mohammed Alkattan**

Mohammed Alkattan earned a BSc in Applied Chemistry in 2009 from Damascus University then worked as a Quality Control in Oubri Pharma. He then pursued an MSc in Drug Chemistry from the University of Newcastle, UK. After that, he was appointed as research scientist between AstraZeneca and University of Nottingham to develop novel nanoparticles for drug delivery. In 2015, he started his PhD in Polymer Chemistry between University of Edinburgh and University of Glasgow where novel monomers and polymers were developed for biomedical applications. In 2018, he led the development, scale up and manufacturing of nanoparticles for drug delivery application at OxSonics – Oxford. Dr Alkattan gained massive experience on the development of nanoparticles for clinical applications in terms of challenges scale up, stability, function, toxicity and regulation. Dr Alkattan is now the leading the research and development of wound dressings at Gentell.

His diverse educational background equips him with a unique perspective and a broad range of skills, making him a valuable asset in the field of polymer chemistry and drug delivery.

He is also a regular reviewer for many high-impact journals.

# Course dates

**9-10 July 2025**

**Live online**

09:00-16:00 **UK (London)** (UTC+01)

Course code 15659

GBP **1,499**

EUR **2,099**

USD **2,399**

**12-13 November 2025**

**Live online**

09:00-16:00 **UK (London)** (UTC+00)

Course code 15660

GBP **1,299** ~~1,499~~

EUR **1,819** ~~2,099~~

USD **2,087** ~~2,399~~

**Until 08 Oct**

**11-12 March 2026**

**Live online**

09:00-16:00 **UK (London)** (UTC+00)

Course code 15661

GBP **1,299** ~~1,499~~

EUR **1,819** ~~2,099~~

USD **2,087** ~~2,399~~

**Until 04 Feb**

## How to book



**Online:**

[ipi.academy/2804](https://ipi.academy/2804)

Alternatively contact us to book, or if you have any queries:



**Email:**

[info@ipiacademy.com](mailto:info@ipiacademy.com)



**Phone:**

[+44 \(0\)20 7749 4749](tel:+442077494749)

## Discounts

- Booking more than one delegate on any one date qualifies for a **30% discount** on the second and subsequent places.
- Most events qualify for an **early booking discount** prior to 6 weeks before the course date. Be sure to check on our website, where the latest discounts will be shown.

## Further information

### Fee

The fee includes all meals and refreshments for the duration of the course (for venue-based courses) and a complete set of course materials (provided electronically). If you have any particular requirements, please advise customer services when booking.

### Please note

IPI Academy (and our training partners) reserve the right to change the content and timing of the programme, the speakers, the date and venue due to reasons beyond their control. In the unlikely event that the course is cancelled, we will refund the registration fee and disclaim any further liability.

### Terms and conditions

The rest of our terms, the event cancellation policy and the terms and conditions are on our website, please visit [ipi.academy/content/terms-and-conditions](https://ipi.academy/content/terms-and-conditions)



## Run this programme in-house for your whole team

Coming to IPI Academy for your in-house training provides an all-inclusive service which gives you access to a wide variety of content, learning platforms and delivery mechanisms as well as your own personal training adviser who will work with you from the initial enquiry through to feedback and follow-up after the programme.

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IPI Academy is a training initiative of Falconbury and Management Forum; leading providers of industry training for over 30 years, based in the UK.

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