

## Dr Haidee M Williams

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### Qualifications

- MBChB – University of Cape Town (UCT), South Africa
- Diploma in Occupational Health (DOH) – UCT, South Africa
- MMed (Occ Med)
- FCPHM (Occ Med)

### Professional Career

- **Current positions:**
  - Specialist occupational medicine consultant
  - Honorary Associate - School of Public Health and Family Medicine, UCT
- **Previous positions:**
  - Head of Health, Safety and Environment - Fine Chemicals Corporation
  - Appointed as a specialist consultant on the Occupational Medicine Panel of the Q(h)ubeka Trust
  - Principal Medical Officer - Bargaining Council for Clothing Workers

### Affiliations with Professional Organisations

- Member – South African Society of Occupational Medicine (SASOM)
- Member – International Commission on Occupational Health (ICOH)
- Examiner – Fellowship of the College of Public Health Medicine, Occupational Medicine
- Honorary Lecturer – Division of Occupational Medicine, School of Public Health, UCT

### Notable Achievements

- Published an article in the International Journal of Environmental Research and Public Health titled “The Utility of Length of Mining Service and Latency in Predicting Silicosis among Claimants to a Compensation Trust” based on the work done at the Q(h)ubeka Trust
- Winning the Aspen Judy Dlamini award for her role in empowering and developing women in the workplace
- Haidee is a wife and mother to two young men. She is also a keen martial artist and holds a third-degree black belt in traditional karate and has represented South Africa in sports karate.



## Manufacture of vaccines: Process and toxicology

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**Keywords: Vaccines, hazardous biological agents, biopharmaceutical production**

### Overview:

#### Vaccine manufacture

Vaccine production is complex and fundamentally different from other kinds of manufacturing (even pharmaceutical manufacturing) in that vaccines are intended to be administered to millions of people of whom most are perfectly healthy. The types of vaccines include: whole virus (inactivated and live-attenuated) vaccines; genetic material RNA (mRNA) vaccines; subunit, recombinant, polysaccharide and conjugate vaccines; toxoid vaccines; and viral vector vaccines.

There is a broad range of different types of vaccines and vaccine manufactures, but one thing they have in common is that they are inherently biological and need to be cultured. Most conventional viral vaccines need to be grown on biological material, such as chicken eggs with influenza vaccines, continuous cell lines with hepatitis A vaccines, or yeast in a fermentation process for hepatitis B vaccines. Bacterial pathogens are grown in bioreactors. Recombinant proteins can be manufactured in bacteria, yeast, or cell culture

#### Toxicity

The active components of vaccines are biological agents and can be pathogenic before inactivation. The additional ingredients and raw materials such as formaldehyde (often used to inactivate viruses), stabilizers, antibiotics, preservatives, and adjuvants pose chemical risks.

The risk assessment process will guide the decisions on which biosafety level (BSL) to apply.