

## Postdoctoral Associate Position in Computational Modeling and 4DCT Imaging of Cochlear Implant Electrode Insertion

**Researchers:** Prof. Hanif Ladak & Dr. Sumit Agrawal

**Department:** Medical Biophysics

**Start Date of Appointment:** September 2026

**Duration:** 24 months with the possibility of extension up to additional 12 months, contingent upon satisfactory performance and funding availability.

**Hours per week:** 40

**Remuneration:** \$65,000 per annum

**Benefits:** See [https://www.uwo.ca/hr/benefits/your\\_benefits/pda](https://www.uwo.ca/hr/benefits/your_benefits/pda)

**Deadline:** Rolling submission. Applications will be accepted until the position is filled.

### Job Description

We are seeking a postdoctoral associate to join the Auditory Biophysics Laboratory at Western University. This position offers an opportunity to contribute to research aimed at improving our understanding of cochlear implant electrode insertion and supporting the development of safer cochlear implant designs, surgical approaches, and insertion strategies.

The successful candidate will work on a project focused on developing and experimentally evaluating computational models of cochlear implant electrode insertion into the fluid-filled cochlea. In addition to predicting electrode path, insertion force, electrode deformation, and wall contact, an important objective will be to estimate intracochlear fluid pressure and pressure transients during insertion. The research will make use of the laboratory's internationally recognized database of synchrotron and X-ray CT images, new four-dimensional X-ray CT (4DCT) imaging of electrode insertion, and experimental measurements for model validation. The work is expected to combine biomedical imaging, FE/FSI modelling, experimental validation, and collaboration with academic and industry partners.

This role provides an opportunity to work at the intersection of auditory biophysics, biomedical imaging, computational modelling, cochlear mechanics, and cochlear implant technology. The successful candidate will contribute to research that addresses critical questions in implant design and surgical deployment, with the long-term goal of reducing insertion trauma, preserving residual hearing, and improving cochlear implant outcomes for patients.

### Responsibilities:

- Conduct literature reviews and associated writing tasks;
- Help design and conduct 4DCT imaging experiments of cochlear implant electrode insertion in fluid-filled cochlear phantoms and/or temporal bone specimens;

- Process and analyze 4DCT image data, including registration, segmentation, electrode tracking, and extraction of insertion trajectories;
- Construct, simulate, test, validate, and optimize FE models of cochlear implant electrode insertion, including electrode deformation, wall contact, friction, and insertion forces;
- Develop computational models to estimate intracochlear fluid pressure and pressure transients during electrode insertion;
- Acquire or coordinate experimental measurements for model validation, such as insertion force, electrode trajectory, and pressure measurements;
- Draft technical reports and write academic publications;
- Present research findings at scientific conferences and partner meetings;
- Collaborate with industry and other partners for knowledge exchange and methodological development;
- Mentor students and perform other duties as assigned.

**Required Qualifications:**

- Ph.D. in biomedical engineering, mechanical engineering, mechatronics engineering, medical biophysics, or a closely related discipline;
- Strong background in solid mechanics, fluid mechanics, biomechanics, mechanics of materials, or related physical modelling relevant to deformable structures and fluid-filled spaces;
- Practical experience using FE analysis, CFD, FSI, explicit dynamics, or related computational methods to model deformation, contact, pressure, or coupled physical systems;
- Ability to work with experimental data and compare computational model predictions against measured or image-derived results, such as imaging, force, pressure, or motion data;
- Experience with biomedical image analysis, including segmentation, registration, three-dimensional reconstruction, or analysis of time-resolved image data;
- Experience using computational modelling and analysis software relevant to the role, such as Abaqus, ANSYS, COMSOL, FEBio, OpenFOAM, MATLAB, Python, 3D Slicer, ITK, or equivalent platforms;
- Strong written and oral communication skills, including the ability to prepare manuscripts, reports, and presentations;
- Ability to organize and prioritize work, manage multiple tasks, meet project deadlines, and work effectively in a collaborative research environment with students, faculty members, clinicians, and industry partners.

**Desirable Qualifications:**

- Familiarity with hearing science, auditory biophysics, otology, cochlear anatomy, or cochlear implants.

**Application Instructions:**

Interested applicants should submit the following documents to Prof. Ladak at [hladak@uwo.ca](mailto:hladak@uwo.ca) with the subject line "Application: Postdoctoral Associate CI Insertion Modeling and 4DCT."

- One-page cover letter detailing your qualifications and interest in this position;
- Curriculum Vitae;
- One sample first-author publication related to computational modelling, biomechanics, FSI/CFD, medical imaging, or a related area;
- Names and e-mail addresses of two referees familiar with your academic work.

**About Western**

Western ranks as one of Canada's top research-intensive universities. From fundamental to applied discovery and other scholarly activities, its scholars advance knowledge that provides tangible benefits for the economic, social, health and cultural development of citizens in London, in Canada and around the world. Western Research supports scholars through collaboration, communication, and service. Western University and its affiliate colleges received more than \$267 million in research funding over the past year.

**Western Values Diversity**

The University invites applications from all qualified individuals. Western is committed to employment equity and diversity in the workplace and welcomes applications from women, members of racialized groups/visible minorities, Indigenous persons, persons with disabilities, persons of any sexual orientation, and persons of any gender identity or gender expression. Accommodations are available for applicants with disabilities throughout the recruitment process.