



COLUMBIA UNIVERSITY

*College of Physicians  
and Surgeons*

In affiliation with  
NewYork-Presbyterian Hospital

**Department of Surgery**  
Human Resources & Academic Affairs  
21 Audubon Ave, Suite 209  
New York, NY 10032

[www.columbiasurgery.org](http://www.columbiasurgery.org)

## **Job Description – Postdoctoral Research Scientist**

### **Position Summary:**

The Division of Cardiac, Thoracic & Vascular Surgery at Columbia University Vagelos College of Physicians and Surgeons is accepting applications for a Postdoctoral Research Fellow. The individual will be responsible for management of laboratory functions and development of a research program that focuses on translational research and basic science applied to pediatric cardiac surgery.

Our lab and collaborating partners combine expertise in tissue biomechanics, polymer science, mechanical engineering, biomedical engineering, small and large animal models, medical device development, prototyping, clinical trial and patent writing.

The individual will spend time in two laboratories: Kalfa lab on the medical campus (Department of Surgery) and Kysar lab on the Morningside campus (Department of Mechanical Engineering). This opportunity focuses on the development of an expandable heart valved device.

Responsibilities of the individual will include:

- 1) The design and fabrication of the valved conduit
- 2) Mechanical testing, including standard and hydrodynamic in a heart valve pulse duplicator, and an accelerated wear tester
- 3) Morphology characterization (SEM)
- 4) Biostability tests and biocompatibility tests
- 5) Assist/perform rat and sheep surgery
- 6) Perform *in vivo* assessment, using the following methods: scanning electron microscopy, histology, immunohistochemistry, mechanical testing and FT-IR spectroscopy
- 7) The individual will be involved in all scientific, experimental and administrative aspects of this research project as well as data analysis.
- 8) The individual will assist the PI on project activities as well as editing manuscripts for reports and publications

Additional responsibilities include academic research in accordance with our compliance and excellence in quality care programs, to include active participation in the education of research fellows, residents and medical students, as well as engineering graduate students. Responsibilities include participation in the academic and research missions of the University, the Department of Surgery and the Department of Mechanical Engineering.

We seek highly motivated, meticulous, highly organized individuals who enjoy working in a team while concomitantly desiring to pursue their own ideas in a very supportive environment.

**The following expertise are required:**

- **Native or high-level English speaking/writing**
- **Strong Article/Grant writing skills required**
- **Experience in Biomedical engineering, including:**
  - **Knowledge in Polymer Science**
  - **Polymer processing methods**
  - **Biostability tests and biocompatibility tests**
  - **Scanning electron microscopy**
  - **Histology**
  - **Immunohistochemistry**

- FT-IR spectroscopy
- **Experience in Mechanical Engineering, including:**
  - **Mechanical Testing,**
  - **Design Optimization**
- **Experience in Experimental and microvascular surgery**

Candidates with

- a previous experience in research projects related to heart valves,
- a previous experience in medical device development and/or biomaterial development
- knowledge in heart valve biology

and candidates passionate about using their research and technical skills for to improve the outcomes of patients with congenital heart diseases have a strong plus.

Columbia University is an Equal Opportunity and Affirmative Action Employer.

**Requirements:**

PhD or MD/PhD

**Minimum Qualifications:**

PhD or MD/PhD

**Preferred Qualifications:**

BS and/or MS in Polymer Science and/or Mechanical Engineering and/or Biomedical Engineering

**To Apply**

Interested individuals can send a resume, together with other rubrics as described to Dr David Kalfa, MD, PhD: [dk2757@cumc.columbia.edu](mailto:dk2757@cumc.columbia.edu) or the address below:

David Kalfa, MD, PhD,  
Department of Pediatric Cardiac Surgery  
New York-Presbyterian Morgan Stanley Children's Hospital  
3959 Broadway, CHN-273  
New York, NY 10032

We welcome applications from candidates who will bring diverse cultural, ethnic, and national and international perspectives to Columbia University's work and campus communities