



**Department of Mechanical Engineering**  
**NATIONAL INSTITUTE OF TECHNOLOGY KARNATAKA, SURATHKAL**

**Advertisement for Junior/senior Research Fellow (JRF/SRF)**

Sep 30, 2020

Applications are invited for the position of Junior Research Fellow (JRF) in a research and development project (Ref. No. IMP/2018/002096) with following details:

**Title of the project:**

**“Development of cost effective Radiofrequency ablation system and magnetic hyperthermia equipment for thermal therapies of cancerous tumors”**

**Principal Investigator:**

**Dr. Ajay Kumar Yadav,**

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**Co-Principal Investigators:**

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**Name of the position:** Junior/senior Research Fellow (JRF/SRF)

**No. of Positions/Vacancies:** One

**Qualifications:**

**Essential Qualifications:-** M.Tech./M.E. in Mechatronics/Thermal Engg./Electronics/Electrical and allied areas with a minimum of 60% aggregate score (6.5/10 CGPA). Candidate must have qualified GATE examination (old gate score is also considered). Proof of M.Tech./ M.E certificate has to be provided during the time of interview. Additionally two years of work experience is needed for SRF.

**Desired Skills:-**

- A good understanding of electronic circuit design, frequency generator, controllers programming skill, COMSOL MULTIPHYSICS software.
- Ability to work in a team, good communication skills and experience in experimental

research for fabrication of setup.

**Age Limit:- 28 years for JRF; 30 years for SRF**

**Salary:-**

- **Rs. 31,000/month (for JRF)**
- **Rs. 35,000/month (for SRF)**

**Duration: 1.5 years (approx.)** or up to the termination of project, subject to annual performance review. The candidate is encouraged to apply for Ph.D. at NITK, Surathkal.

**How to apply:** Interested candidates must apply with the following documents (1) Cover letter (2) Bio-data with passport-sized photograph, (3) Scanned copies of educational certificates and mark sheets, class XII onwards (4) GATE qualified certificate and (5) Scanned copies of Proof for research experience, special achievements and publications, if any.

The soft copies of all the above documents (pdf format) must be **emailed to the P.I. (Dr. Ajay Kumar Yadav) by 15<sup>th</sup> Oct 2020**. The email address for correspondence is given above. Only shortlisted candidates will be intimated by email and called for **online interview**. The position is available immediately. Interview is most likely to be held during 3<sup>rd</sup> week of Oct 2020. The appointment will be on a purely temporary basis co-terminus with the project.

**About the project:**

**Total duration: 3 YEARS (2019-2022)**

Funding Agency: Science & Engineering Research Board (SERB)

**Project summary:**

Cancer is the main threat to the human beings and finding a suitable treatment is a great challenge for researchers. Thermal therapy is one of the suitable methods used to kill the cancer cells by exposing target tissue to high temperatures causing destruction of tissue directly (called thermal ablation with temperature  $> 50^{\circ}\text{C}$ ) or render the cancer cells more susceptible to other treatment modalities like chemotherapy/radiation therapy (hyperthermia with temperature up to  $50^{\circ}\text{C}$ ). Out of all methods of thermal therapies, Radiofrequency ablation (RFA) is the most widely used and accepted method to treat tumors located in different parts of the body like liver, lung, prostate, bone, kidney, breast etc.

Currently, RFA equipment's are available in the market with different power output (60 and 250 W). Due to their limited availability, accessibility and higher cost (greater than 12 lakh INR), most of the people in the world are not benefited from this technique. Our current objective is to develop a prototype of higher power output similar to the setup available in market with a temperature controller at an affordable price (less than 1.5 lakh). Work can be extended to develop a magnetic hyperthermia setup for non-invasive treatment of tumors (most suitable for brain tumors) in low cost. Testing of the developed prototypes will be carried out on the tissue mimicking phantoms, and preclinical trials will be carried out on petri-dish and animals (nude mice).

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