

# Coverage Dossier

## Osteoarthritis Research



Prepared by

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**Headline: IIT-R develops low-cost osteoarthritis cure**

URL: <http://www.thehansindia.com/posts/index/Young-Hans/2017-09-07/A-new-low-cost-method-for-treatment-of-osteoarthritis/324879>

#### OUR BUREAU

**Hyderabad:** Researchers at the Indian Institute of Technology Roorkee come up with a new, low-cost method for treating Osteoarthritis, a degenerative joint disease which leads to loss of bone cartilage and eventual inflammation of bone and joints. The research published in the 'Journal for Materials Science - Biomaterials' talks about the use of implantable ferromagnetic nanoparticles with thermal properties for hyperthermia treatment of the afflicted knee joints. Lead by Prof K L Yadav, the team at IIT Roorkee developed a specific ferrite nanomaterial, which when embedded with Poly (vinylidene fluoride) is proposed as a biocompatible magnetic-dielectric composite to provide prolonged thermo-regulated treatment. These polymers based nanoparticles injected around the knee joint along with normal heat therapy will be able to provide long term heat therapy for the patient.

Talking about the research, Prof K L Yadav, Professor and Head of Physics Department at IIT Roorkee said, "Cur-

## A new, low-cost method for treatment of osteoarthritis



rently, the treatment of Osteoarthritis is done using anti-inflammatory drugs and steroids, which have critical side effects on patients. Also, the treatment using such

drugs cannot inhibit the natural progression of this degenerative disease.

Other than these, techniques like knee replacement is also used, but are expensive

and have a long recovery time. We wanted to develop a low cost, affordable, safe and simple therapeutic technique to inhibit the progression of the disease and enable the patient

to recover faster."

"We developed magnetic polymer matrix composite using ferromagnetic nanoparticle structures insulated with Poly (vinylidene fluoride) polymer. It is proposed that the synthesized material in a liquid form may be injected into the affected knee joint. Once the liquid is inserted into the knee joint, the hyperthermia treatment through electromagnetic radiation can be given on the specific area at regular intervals. The heat generated during this process by the nanoparticles will spread over the afflicted area for a long duration without affecting the nearby cells or tissues. This will help us in getting a focussed treatment only in the area where the therapy is required.", he added.

The team studied the effectiveness of the developed composite for the hyperthermia treatment using a model of Knee Patella in COMSOL Multiphysics software and preliminary biocompatibility studies were also undertaken to ensure safe biomedical application and use.

Date:10th September 2017

Publication: Amar Ujala (clip attached)

Edition: Dehradun

Page no: 1

Journalist: NA

Headline: IIT Roorkee Researchers Develop a New, Low Cost Method For Treatment Of Osteoarthritis

URL: NA

# ओस्टियोपोरोसिस का दर्द नहीं करेगा परेशान

## आईआईटी रुड़की के विज्ञानियों ने खोजा 'मैग्नेटिक पॉलीमर कंपोजिट मैट्रिक्स' नैनो पार्टिकल

अरविंद सिंह  
रुड़की।

ओस्टियोपोरोसिस (अस्थि क्षरण) रोग का असहनीय दर्द झेल रहे मरीजों के लिए राहत भरी खबर है। आईआईटी रुड़की के भौतिक विज्ञानियों ने एक ऐसे नैनो मैटेरियल की खोज की है, जिससे न केवल बीमारी से पीड़ित मरीजों को दर्द से निजात मिलेगी, बल्कि हड्डियों को गलने से भी बचाया जा सकेगा। आईआईटी के भौतिक विज्ञानियों का दावा है कि इन नैनो मैटेरियल के इस्तेमाल से मरीजों का सस्ते खर्च पर बेहतर इलाज किया जा सकेगा। आईआईटी रुड़की के भौतिक

शोध विज्ञानियों ने  
बायोलॉजिकल टेस्ट में  
खरा पाया नैनो मैटेरियल



विज्ञान विभाग के विभागाध्यक्ष प्रो. केएल यादव की अगुवाई में शोध विज्ञानियों की चार सदस्यीय टीम ने 'मैग्नेटिक पॉलीमर कंपोजिट मैट्रिक्स' नैनो मैटेरियल तैयार किया है। इसमें >> शेष पेज 11 पर

### ओस्टियोपोरोसिस

**कारण:** डॉक्टरों के मुताबिक शरीर में विटामिन डी की कमी, शराब के अत्यधिक सेवन, ज्यादा धूम्रपान, शरीर को ज्यादा आराम देने से इस बीमारी का खतरा बढ़ जाता है। एक्स-रे या बोन गिनरल डेंसिटी यानी बीएमडी टेस्ट की मदद से इस बीमारी का पता लगाया जा सकता है।

**लक्षण:** ओस्टियोपोरोसिस बीमारी में घुटने और पीठ में असहनीय दर्द के साथ ही रोगी की लंबाई भी घट जाती है। चलने फिरने में दर्द होता है। बीमारी गंभीर हो तो रीढ़ की हड्डी टूटने के साथ ही कूल्हे की हड्डियां टूटने लगती हैं। इस बीमारी की गिरफ्त में आए 30 फीसदी मरीजों के कूल्हे की हड्डियां टूट जाती हैं।

### महिलाओं में बीमारी का खतरा सबसे ज्यादा

अस्थिरोग विशेषज्ञ डॉ. नवीन अग्रोही के मुताबिक ओस्टियोपोरोसिस (अस्थि क्षरण) बीमारी का खतरा महिलाओं में ज्यादा होता है। तमाम कारणों के चलते महिलाओं में विटामिन डी की भारी कमी हो जाती है जिससे इस बीमारी का खतरा ज्यादा बढ़ जाता है। इसके अलावा मोटापाग्रस्त और समय से पूर्व रजोनिवृत्ति वाली महिलाओं में इस बीमारी का खतरा ज्यादा बढ़ जाता है। एक अनुमान के मुताबिक देश में 46 मिलियन महिलाएं इस बीमारी से जूझ रही हैं।

Date: 11th September 2017

Publication: The Financial Express (clip attached)

Edition: Delhi / Mumbai / Pune / Bangalore / Hyderabad / Chennai / Kolkata / Kochi / Ahmedabad

Page no: 12

Journalist: NA

**Headline: A potential new treatment for osteoarthritis**

URL: <http://www.financialexpress.com/lifestyle/health/a-potential-new-treatment-for-osteoarthritis/849774/>

## A potential new treatment for osteoarthritis

IIT Roorkee researchers say they have a new method for treating the disease

FE BUREAU

**RESEARCHERS AT THE** Indian Institute of Technology Roorkee have claimed they have developed a new, low-cost method for treating osteoarthritis, a degenerative joint disease that leads to loss of bone cartilage and eventual inflammation of bone and joints.

The research, published in the *Journal of Materials Science*, talks about the use of implantable ferromagnetic nanoparticles with thermal properties for hyperthermia treatment of the afflicted knee joints.

Led by Prof KL Yadav, the team developed a specific ferrite nanomaterial, which when embedded with polyvinylidene fluoride matrix is proposed as the biocompatible magnetic-dielectric composite to provide prolonged thermo-regulated treatment.

The study proposed that the synthesised material in a liquid form may be injected into the affected knee joint, and once the liquid is inserted, hyperthermia treatment through electromagnetic radiation can be given on the specific area at regular intervals. The heat generated during this process by nanoparticles will spread over the afflicted area for a longer duration without affecting nearby cells. This will lead to focused treatment in the area where the therapy is required.

Talking about the research, Prof Yadav, who is the head of Physics Department at IIT Roorkee, said, "Currently, the treatment of osteoarthritis is done using anti-inflammatory drugs and steroids, which have critical side-effects. Also, the treatment using such drugs cannot inhibit the natural progression of this degenerative disease. While techniques like knee replacement are available, they are expensive and have a long recovery time. We wanted to develop a low-cost, affordable, safe and simple therapeutic technique to inhibit the progression of the disease and enable the patient to recover faster."

(The published research can be accessed here: <https://goo.gl/orv3pi>)

Online

Date: 8th September 2017

Publication: The Financial Express

Edition: Online

Journalist: NA

**Headline: IIT-Roorkee develops low-cost osteoarthritis cure**

URL: <http://www.financialexpress.com/india-news/iit-roorkee-develops-low-cost-osteoarthritis-cure/845882/>

### **IIT-Roorkee develops low-cost osteoarthritis cure**

Researchers at IIT, Roorkee, have developed a low-cost method using implants with long-term heat therapy to treat osteoarthritis, a disease that causes pain and stiffness in the joints leading to degeneration of the bone cartilage.

The research paper, published in the Journal for Materials Science (biomaterials), talks about the use of implantable ferromagnetic nanoparticles with thermal properties for hypothermia treatment of the afflicted knee- joints.

Led by Prof. K L Yadav, the head of the physics department at IIT-Roorkee, the team at the institute developed a specific ferrite nanomaterial (a material produced by nanotechnology), which, when embedded with poly (vinylidene fluoride), forms a bio-compatible magnetic-dielectric composition to provide prolonged thermo-regulated treatment.

These polymer-based nanoparticles, injected around the knee-joint under with normal heat therapy, will be able to provide long-term heat therapy for the patient, a press release from the Indian Institute of Technology (IIT) said.

Currently, osteoarthritis is treated using anti- inflammatory drugs and steroids, which have critical side- effects on patients. Moreover, such treatment cannot inhibit the growth of this degenerative disease, the release said.

Techniques such as knee-replacement are also used, but are expensive and have a long recovery time, it added.

“We wanted to develop an affordable, safe and simple therapeutic technique to inhibit the growth of the disease and enable the patient to recover faster,” Prof. Yadav said.

Date: 8th September 2017

Publication: Bio-Spectrum

Edition: Online

Journalist: NA

**Headline: Low cost method for treatment of osteoarthritis developed by IIT Roorkee researchers**

URL:

<https://www.biospectrumindia.com/news/68/9504/low-cost-method-for-treatment-of-osteoarthritis-developed-by-iit-roorkee-researchers-.html>

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Techniques such as knee-replacement are also used, but are expensive and have a long recovery time, it added.

"We wanted to develop an affordable, safe and simple therapeutic technique to inhibit the growth of the disease and enable the patient to recover faster," Prof. Yadav said. IIT-Roorkee develops low-cost osteoarthritis cure

Date: 8th September 2017

Publication: Business Standard

Edition: Online

Journalist: NA

**Headline: IIT-Roorkee develops low-cost osteoarthritis cure**

URL: [http://www.business-standard.com/article/pti-stories/iit-roorkee-develops-low-cost-osteoarthritis-cure-117090701288\\_1.html](http://www.business-standard.com/article/pti-stories/iit-roorkee-develops-low-cost-osteoarthritis-cure-117090701288_1.html)

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Techniques such as knee-replacement are also used, but are expensive and have a long recovery time, it added.

“We wanted to develop an affordable, safe and simple therapeutic technique to inhibit the growth of the disease and enable the patient to recover faster,” Prof. Yadav said.

Date: 8th September 2017

Publication: India Today

Edition: Online

Journalist: NA

**Headline: IIT-Roorkee develops low-cost osteoarthritis cure**

URL: <http://indiatoday.intoday.in/story/iit-roorkee-develops-low-cost-osteoarthritis-cure/1/1043121.html>

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Date: 8th September 2017

Publication: India Education Diary

Edition: Online

Journalist: NA

**Headline: IIT Roorkee researchers develop a new, low cost method for treatment of osteoarthritis**

URL: <https://indiaeducationdiary.in/iit-roorkee-researchers-develop-new-low-cost-method-treatment-osteoarthritis/>

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Techniques such as knee-replacement are also used, but are expensive and have a long recovery time, it added.

“We wanted to develop an affordable, safe and simple therapeutic technique to inhibit the growth of the disease and enable the patient to recover faster,” Prof. Yadav said.

Date: 8th September 2017

Publication: India.com

Edition: Online

Journalist: NA

**Headline: IIT-Roorkee develops low-cost osteoarthritis cure**

URL:

<http://www.india.com/news/agencies/iit-roorkee-develops-low-cost-osteoarthritis-cure-2456435/>

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Techniques such as knee-replacement are also used, but are expensive and have a long recovery time, it added.

"We wanted to develop an affordable, safe and simple therapeutic technique to inhibit the growth of the disease and enable the patient to recover faster," Prof. Yadav said.

Date: 8th September 2017

Publication: PTI

Edition: Online

Journalist: NA

**Headline: IIT-Roorkee develops low-cost osteoarthritis cure**

URL: [http://www.ptinews.com/news/9049953\\_IIT-Roorkee-develops-low-cost-osteoarthritis-cure.html](http://www.ptinews.com/news/9049953_IIT-Roorkee-develops-low-cost-osteoarthritis-cure.html)

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Date: 8th September 2017

Publication: Outlook

Edition: Online

Journalist: NA

**Headline: IIT-Roorkee develops low-cost osteoarthritis cure**

URL: <https://www.outlookindia.com/newscroll/iitroorkee-develops-lowcost-osteoarthritis-cure/1141184>

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Date: 8th September 2017  
Publication: Telangana Today  
Edition: Online  
Journalist: NA

**Headline: IIT Roorkee researchers develop low cost method treatment for osteoarthritis**

URL: <https://telanganatoday.com/iit-roorkee-researchers-develop-low-cost-method-treatment-for-osteoarthritis>

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Date:10th September 2017

Publication: Biotech Times

Edition: Online

Journalist: NA

**Headline: IIT Roorkee Researchers Tests New Method For Knee Pain Treatment**

URL: <https://biotechtimes.org/2017/09/08/iit-roorkee-researchers-tests-new-method-knee-pain-treatment-2/>

## **IIT Roorkee Researchers Tests New Method For Knee Pain Treatment**

Researchers at the Indian Institute of Technology Roorkee have tested a new method for treating problems relating to knee joints using a novel nanomaterial, and found it effective in initial studies.

Scientists used a specific ferrite nano-material, embedding it with Poly vinylidene fluoride (PVDF) to make a magnetic-dielectric composite. This material, researchers say, can be used to provide thermo-regulated treatment for osteoarthritis. It is also biocompatible.

The effectiveness of the new composite has been tested using a computer model of knee patella and preliminary biocompatibility studies have also undertaken to study its biosafety. The results of the study have been published in Journal for Materials Science – Biomaterials.

Researchers said that it may be possible to implant the nanomaterial around affected regions and then use heat therapy to 'activate' nanoparticles which can then keep heating the affected region. "Since polymer-based nanoparticles can be injected around knee joints, they will be able to provide long term heat therapy due to their thermal properties," pointed out and Prof. K.L. Yadav, who led the research team.

Prof. Yadav said that it would be possible to implant the new material into knee joints once a liquid formulation was developed. "The heat generated by nanoparticles, when heat treatment is given, will spread over the afflicted area for a long duration without affecting nearby cells or tissues. This will help us in getting a focused treatment only in the area where the therapy is required," he added.

Osteoarthritis is a degenerative joint disease which leads to loss of bone cartilage and eventual inflammation of bone and joints. The present line of treatment for of Osteoarthritis involves anti-inflammatory drugs and steroids, which critical side effects. Other techniques like knee replacement costly. "We wanted to develop a low cost, affordable, safe and simple therapeutic technique to inhibit the progression of the disease and enable the patient to recover faster," he added. The team is also planning to carry forward the research with human clinical trials in collaboration with hospitals.

Date:10th September 2017

Publication: BioVoice

Edition: Online

Journalist: NA

**Headline: IIT Roorkee researchers develop low cost method for treatment of osteoarthritis**

URL: <http://www.biovoicenews.com/iit-roorkee-researchers-develop-low-cost-method-treatment-osteoarthritis/>

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Date: 10th September 2017

Publication: APN Live

Edition: Online

Journalist: Jyoti Singh

**Headline: IIT-Roorkee researchers explore new treatment for knee pain**

URL: <http://www.apnlive.com/technology-news/iit-roorkee-researchers-explore-new-treatment-knee-pain-26381>

## **IIT-Roorkee researchers explore new treatment for knee pain**

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Date: 10th September 2017

Publication: The India Saga

Edition: Online

Journalist: NA

**Headline: IIT Roorkee Researchers Develop A New, Low Cost Method For Treatment Of Osteoarthritis**

URL: <http://theindiasaga.com/social-sector/iit-roorkee-researchers-develop-a-new-low-cost-method-for-treatment-of-osteoarthritis>

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Date: 11th September 2017  
Publication: Uttarakhand News Network  
Edition: Online  
Journalist: NA

**Headline: IIT-Roorkee Develops Low-Cost Osteoarthritis Cure**

URL: <http://uttarakhandnewsnetwork.com/2017/09/iit-roorkee-develops-low-cost-osteoarthritis-cure/>

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Date: 11th September 2017

Publication: Pioneer News

Edition: Online

Journalist: NA

**Headline: A potential new treatment for osteoarthritis**

URL: <http://www.pioneernews.in/2017/09/10/a-potential-new-treatment-for-osteoarthritis/>

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Date: 11th September 2017

Publication: News Room

Edition: Online

Journalist: NA

**Headline: Hope of a new treatment for knee pain**

URL: <https://newsroom24x7.com/2017/09/08/hope-of-a-new-treatment-for-knee-pain/>

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Date: 11th September 2017

Publication: Medical Buyer

Edition: Online

Journalist: NA

**Headline: IIT Roorkee Researchers Develops Method For Treatment Of Osteoarthritis**

URL:<http://www.medicalbuyer.co.in/index.php/13651-iit-roorkee-researchers-develops-new-low-cost-method-for-treatment-of-osteoarthritis>

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