

**Scientific & Technological Achievements of I.R. of Iran**  
(May-June 2017)

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- Production of vacuum pumps used in petroleum industry
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## **A) Medical and Biotechnological equipments & findings**

### **Production of nano sensor for detection colon cancer**

Iranian researchers at Mazandaran University have succeeded to produce nano sensor for detection colon cancer. Early detection of colon cancer is important to identify the best treatment. High accuracy, early detection and low cost are the features of the new method. The results of the research have been published in Biosensors and Bioelectronics.<sup>1</sup>

### **Detection the gene responsible for Parkinson disease**

Iranian Researchers at Tehran University have succeeded to detect the gene responsible for Parkinson disease, so they hope to provide the treatment of the disease. In this way the nature of genetic material and DNA sequences of healthy and sick people have been compared for better understanding of biological and physiological features. The results of the research have been published in journal of Science.<sup>2</sup>

### **Treatment of oral infectious diseases using herbal toothpaste**

Iranian scientists have provided a kind of herbal toothpaste using for treatment of oral infectious diseases. Being edible with no chemicals, anti-microbial, usable for all ages, detoxification of the body and treatment of mouth and chest infections are the most important advantages of the production.<sup>3</sup>

### **New method for removal contaminants from water**

Iranian researchers at Qom University have produced a new nano catalyst from walnut shell and a plant, which is able to remove contaminants from water in one minute. Low cost, high efficiency, bio compatibility, simplicity and no need to toxic solvents are the most important characteristics of the method. This nano catalyst can be used in purification of wastewater such as textile industry. The results of the research have been published in journal of Environmental Science and Pollution Research.<sup>4</sup>

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<sup>1</sup> - <http://www.mehrnews.com/news/3997850/>

<sup>2</sup> - <http://sinapress.ir/news/print/59355>

<sup>3</sup> - <http://www.isna.ir/news/96032010690/>

<sup>4</sup> - <http://tnews.ir/news/728787437315.html/>

### **Providing scaffold for treatment heart-failure by Iranian researchers**

Iranian Scientists at Amir Kabir University have provided a new scaffold for treatment heart-failure. This scaffold has the ability to rebuild heart tissue and can be used as a supportive material to reduce the symptoms of heart failure. The result of the research is suitable for heart and nerve tissue engineering.<sup>5</sup>

### **New method for reducing hospital infections**

Iranian researchers at Azad University have succeeded to produce a kind of paint for sterilization of medical equipments using nano tech. its' anti bacterial property remains as long as the paint is not scratched. High durability, bio friendly, absorption of light in the day and glow at night are the main properties of the method. This nano paint can be used as coating for medical equipments, household appliances, car and different industries.<sup>6</sup>

### **Removal of carcinogenic compounds from wastewater**

Iranian Scientists at Kerman University have produced nano composite to remove carcinogenic compounds from wastewater. The most important features of the way are high bio compatibility, easy usage, low cost and high efficiency. The results of the research have been published in Journal of Chromatography A.<sup>7</sup>

### **Iranian researchers use stem cells in hair loss treatment**

Iranian researchers at Royan Institute have taken a decisive step toward treatment of hair loss by conducting studies on stem cells and their effect on hair growth. In this method, they cultivated two kinds of stem cells in laboratorial conditions, so the hair growth was tangible and visible to unaided eye. The results of the research have been published in Cell Journal.<sup>8</sup>

### **Scientists produce canned pistachio with herbal preservatives**

Iranian researchers managed to produce canned pistachio consisting of herbal preservatives that help reduce effectively the problems of product packaging. Herbs used as preservatives in forming the canned pistachio are of medicinal nature to treat and prevent many

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<sup>5</sup> - <http://www.isna.ir/news/96030905131/>

<sup>6</sup> - <http://khabarfarsi.com/u/39452799>

<sup>7</sup> - <http://www.isna.ir/news/96022717371/>

<sup>8</sup> - <http://en.mehrnews.com/news/125516/Researchers-use-stems-cells-in-hair-loss-treatment>

diseases. Removal of Aflatoxin contamination and high value-added are other features. The project has been patented in the country<sup>9</sup>.

### **Reducing the toxicity of drug carriers by nano particles**

Iranian researchers at Azad University have succeeded to reduce the toxicity of drug carriers by nano particles. Low side effects on healthy tissues, inhibition of structural changes and no accumulation of proteins are the properties of the way. The results of the research have been published in scientific reports.<sup>10</sup>

### **Diagnosis of metastatic cancer cells by nano sensors**

Iranian researchers at Tabriz University have produced a nano sensor for early detection of metastatic cancer cells to prevent weakens immune system. The most outstanding features are low cost, fast reaction, simple construction and high accuracy with wide detection range. This nano sensor provides the ability to study the effect of new drugs on cancerous cells in laboratory with no need to alive. The results of the research have been published in Biosensors and Bioelectronics.<sup>11</sup>

## **B) Industrial and Software equipments & findings**

### **New method for increasing structural strength**

Iranian scientists have succeeded to increase the strength of structures up to 50 percent by adding a kind of nano product to stainless substance. High strength, no need to re-painting and cost efficient are the most important properties of the method.<sup>12</sup>

### **Production of insulating materials using polymeric bottles**

Iranian researchers have provided a new method for conversion plastic bottles into rigid foams for insulating materials. High mechanical and thermal features, reduction the problems

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<sup>9</sup> - <http://en.mehrnews.com/news/125429/Iran-produces-canned-pistachio-with-herbal-preservatives>

<sup>10</sup> - <http://www.ilandnews.ir/News/3587/>

<sup>11</sup> - <http://www.ghatreh.com/news/nn37677183/>

<sup>12</sup> - <http://www.isna.ir/news/96023119901/>

of recycling these materials, bio compatibility and low production of toxic gases are the advantages of the way. These insulators can be used in refrigerators.<sup>13</sup>

### **Scientists provide new method for using in touch screens**

Iranian researchers at Shiraz University have succeeded to revive graphene oxide to graphene for production of touch screens. Suitable absorbing for purification of water and electromagnetic waves, high electrical, mechanical and thermal features, good conductivity, high performance and bio compatibility are the properties of the method. The new material can be used in pharmaceuticals, hydrogen storage, fuel cells, super capacitors, batteries, solar cells, polymer composites, light panels and computers.<sup>14</sup>

### **Production of new polymer with high anti-corrosion effect**

Iranian scientists have produced a new polymer with high anti-corrosion effect on metal surfaces especially in seawater. High performance and low cost in comparison with other samples are the most important advantages of the way.<sup>15</sup>

### **Extraction of minerals with minimal side effects**

Iranian researchers at Shahrekord University have succeeded to provide a new method for extraction of minerals with minimal side effects. Lower side effects on the body such as increasing blood viscosity and no change in minerals are the benefits of the method. These minerals can be used in medical and pharmaceutical industries.<sup>16</sup>

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<sup>13</sup> - <http://www.energyenergy.ir/index.php/fa/>, <http://www.isna.ir/news/96011605438/>

<sup>14</sup> - <http://www.isna.ir/news/96021308256/>

<sup>15</sup> - <http://www.ghatreh.com/news/nn37601440/>

<sup>16</sup> - <http://parsipoo.ir/news/1495395000781079/>

## **C) Petrochem, Energy, Oil and Gas Industrial equipments & findings**

### **Scientists reduce energy consumption in cooling systems**

Iranian scientists have produced a kind of nano-fluid to reduce energy consumption in cooling systems. It decreases about 2 percent the oil temperature of cooling systems during the heat and can be used in power plants, compressors, chillers and facilities.<sup>17</sup>

### **Iranian researchers provide new method for gas separation**

Iranian researchers at Isfahan University have provided nano absorber for separation of hydrogen sulfide gas. Non-toxic, reusability, high efficiency and low cost are the most important advantages of nano absorber. It can be used in oil industry, gas refineries, petrochemical plants and wastewater treatment plants. The results of the research have been published in the journal of Chemistry Engineering & Industrial Research.<sup>18</sup>

### **Production of vacuum pump used in petroleum industry**

Iranian scientists have produced vacuum pump used in oil and petroleum industries. Creation a vacuum place, filtration and drain mixture of gas and steam from systems are the functions of vacuum pump. It can be used in printing industry, food industry, medical and laboratory.<sup>19</sup>

### **Construction of nano structured solar cells by Iranian researchers**

Iranian researchers at Azad University have succeeded to construct nano structured solar cells. Low cost, high efficiency, bio compatibility, reduction in consumption of fossil fuels and using of solar energy as a renewable energy are the most important advantages of the method.<sup>20</sup>

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<sup>17</sup> - <http://www.isna.ir/news/96030703654/>

<sup>18</sup> - [http://nano.ir/index.php?ctrl=news&actn=news\\_view&site\\_id=1&lang=1&id=58561](http://nano.ir/index.php?ctrl=news&actn=news_view&site_id=1&lang=1&id=58561)

<sup>19</sup> - <http://www.ghatreh.com/news/nn37633068/>

<sup>20</sup> - <http://www.isna.ir/news/96031608198/>