How sleep can boost your body's immune response

By Maria Cohut
Curated by - Jay Tatiya S Y B. Pharm
Guided by – Devendra Shirode

Researchers have demonstrated the importance of good-quality sleep time and time again, showing that a solid night's rest can contribute to many aspects of physical and mental well-being. One new study has explained how sleep contributes to the proper functioning of the immune system.

Recent research also suggests that poor sleep increases pain sensitivity and may raise the likelihood of developing cardiovascular problems.

Now, a study recently conducted by a team from the University of Tübingen in Germany has found a mechanism linking sleep to the functioning of the immune system.

The researchers who led this study found that a good night's sleep can boost the effectiveness of certain specialized immune cells called T cells. 'Sleep could enhance T cell responses'

Since adrenaline and prostaglandin levels tend to drop during sleep, the scientists chose to go one step further and study this phenomenon in greater detail in human participants.

They took T cells from some volunteers who slept and some who remained awake. After analyzing these samples, Dimitrov and team saw that the T cells of sleeping people had higher levels of integrin activation compared with the same cells taken from people in a waking state.

So, the authors note, this indicates that sleep has a positive impact on the correct functioning of T cells as part of the body's immune response, and this is thanks to the fact that Gas-coupled receptor agonists are less active at this time.

Conclusion (Jay Tatiya)

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One new study has explained how sleep contributes to the proper functioning of the immune system. This indicates that sleep has a positive impact on the correct functioning of T cells as part of the body's immune response, due to the fact that Gas-coupled receptor agonists are less active at this time.

Nanoparticle breakthrough in the fight against cancer
Ulsan National Institute of Science and Technology (UNIST)

Curated By -Jay Tatiya (S Y B Pharm)
Guided by – Dr Shilpa Chaudhari

A team of researchers, affiliated with UNIST has recently introduced a novel targeted drug delivery system that can improve the pharmacological and therapeutic properties of conventional cancer treatments. The new technology has dramatically enhanced safety and efficiency through the use of the supramolecularly built protein corona shield as a targeting agent through regulating the interfaces between nanoparticle and biological systems.

This breakthrough has been jointly led by Professor Ja-Hyoung Ryu, Professor Sebyung Kang, and Professor Chaekyu Kim in the School of Life Sciences at UNIST. Their findings have been published online in Nature Communications (IF: 12.353).

Targeted drug delivery system refers to the method that selectively transports drugs to targeted tissues, organs, and cells through a variety of drugs carrier. Though tens of thousands of drug delivery systems have been developed, the effect has been minimal. This is because hundreds of proteins in the body stick to the drug delivery system (protein corona phenomenon). Because of this phenomenon, even when the drug reaches a target such as a cancer cell, the treatment efficiency is very low, and other side effects have been observed, which may cause toxic side effects.

"It was reported that it is possible to alleviate the impact of protein corona on target drug delivery through the formation of protective shield, made up of well-structured special proteins that are highly stable and do not interact with each other," says Professor Ryu. "The new technology is much like the strategy where you take control of your enemies, using enemies."

In this work, the research team introduced the protein corona shield (PCS) concept for an efficient target drug delivery system. Using recombinant DNA technology, the research team has created recombinant fusion proteins with the enhanced physical stability and cancer-selective targeting ability. This fusion protein, then, was used as a shield to encapsulate the surface of nanoparticle drug carriers, thus constructing PCS nanoparticle (PCSNs).

In principle, nanoparticle drug carriers with a target ligand lose their targeting ability on being coated by blood proteins in a biological environment. However, the new PCS system can inhibit blood protein adsorption to maintain the targeting ability and avoid unwanted clearance by the mononuclear phagocyte system. To understand the interactions between PCSNs and external biological components, the research team has created an environment similar to human biological systems. This has been analyzed via computer simulation. The results showed about 10 times greater therapeutic efficacy in preventing the invasion of unwanted external proteins.

They also examined the effect of drug delivery using immune cells and cancer cells. The PCS drug delivery system could kill cancer cells without being caught by immune cells, even after long-term exposure to biological environments. In mouse models of cancer, the team found that the PCSN exhibit lower toxicity, as well as excellent tumor-targeting ability.

Conclusion(Jay Tatiya)

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Smart micro robots that can adapt to their surroundings

Ecole Polytechnique Fédérale de Lausanne

Curated By-Jay Tatiya (S Y B Pharm)

Guided by Mukesh Mohite

One day we may be able to ingest tiny robots that deliver drugs directly to diseased tissue, thanks to research being carried out at EPFL and ETH Zurich. The group of scientists - led by Selman Sakar at EPFL and Bradley Nelson at ETH Zurich - drew inspiration from bacteria to design smart, biocompatible micro robots that are highly flexible. Because these devices are able to swim through fluids and modify their shape when needed, they can pass through narrow blood vessels and intricate systems without compromising on speed or maneuverability. They are made of hydrogel Nano composites that contain magnetic nanoparticles allowing them to be controlled via an electromagnetic field.

When we think of robots, we generally think of bulky machines equipped with complex systems of electronics, sensors, batteries and actuators. But on a microscopic scale, robots are entirely different."Our robots have a special composition and structure that allow them to adapt to the characteristics of the fluid they are moving through. For instance, if they encounter a change in viscosity or osmotic concentration, they modify their shape to maintain their speed and maneuverability without losing control of the direction of motion," says Sakar.

Inspired by nature

"Nature has evolved a multitude of microorganisms that change shape as their environmental conditions change. This basic principle inspired our micro robot design. The key challenge for us was to develop the physics that describe the types of changes we were interested in, and then to integrate this with new fabrication technologies," says Nelson. In addition to offering enhanced effectiveness, these miniaturized soft robots can also be manufactured easily at a reasonable cost. For now, the research team is working on improving the performance for swimming through complex fluids like those found in the human body.

Conclusion (Jay Tatiya)

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research team is working on improving the performance for swimming through complex fluids like those found in the human body. When we think of robots, we generally think of bulky machines equipped with complex systems of electronics, sensors, batteries and actuators.

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Edible robots have a special composition and structure that allow them to adapt to the characteristics of the fluid they are moving through. For instance, if they encounter a change in viscosity or osmotic concentration, they modify their shape to maintain their speed and maneuverability without losing control of the direction of motion. These miniaturized soft robots can also be manufactured easily at a reasonable cost

Study may explain why Once-promising Cancer drugs failed (Duke University)

Curated By-Pragya Chaudhari T Y B Pharm

Guided by Dr Sonali Mahaparale

Nearly two decades after a class of once-promising cancer drugs called MMP inhibitors mysteriously failed in clinical trials, scientists think they may have an explanation for what went wrong. The findings in C. elegans worms could lead to better ways to prevent the first steps of metastasis, the spread of the disease responsible for 90 percent of cancer deaths.

MMP inhibitors were aimed at blocking a group of enzymes long thought key to cancer's spread. Called matrix metalloproteinase, the enzymes help dissolve the tough outer membrane that surrounds both tumors and healthy tissues, allowing cancer cells to escape from their original locations and set up shop in other organs.

Yet despite promising results in mice, MMP inhibitors didn't help people with cancer live longer and some patients developed serious side effects.

The new findings, from a team led by biology professor David Sherwood at Duke University, suggest that invasive cells switch to brute force and build a battering ram when their dissolving enzymes aren't available.

The study appears online January 24 in the journal Developmental Cell. The researchers hope their work in worms will identify drug targets that could one day be tested in combination with MMP inhibitors to better treat metastasis in humans.

If researchers can develop drugs that inhibit both MMP enzymes and the battering rams, they may be able to more effectively block cell invasion and keep cancer from spreading.

Julie Plastino and David Sherwood performed the experiments and shared the news about the MMP inhibitors failed.

Conclusion: (Pragya Chaudhari)

Nearly two decades after a class of once-promising cancer drugs called MMP inhibitors mysteriously failed in clinical trials. Yet despite promising results in mice, MMP inhibitors didn't help people with cancer live longer and some patients developed serious side effects. The findings, from a team led by biology professor David Sherwood at Duke University, suggest that invasive cells switch to brute force and build a battering ram when their dissolving enzymes aren't available.

Conclusion (Dr Sonali Mahaparle)

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New FDA Approvals CDER

Reprinted & curated By-Rohit Katariya (S Y B Pharm)

Amrix

The FDA recently approved a new administration method for Teva's extended-release cyclobenzaprine hydrochloride (Amrix). The skeletal muscle relaxant indicated for the relief of muscle spasm associated with painful musculoskeletal conditions can now be sprinkled onto a tablespoon of applesauce and swallowed immediately without chewing.

The agency noted that this new administration method should only be used by patients able to reliably swallow applesauce without chewing. Additionally, other foods should not be substituted for applesauce, as they have not been tested for use.

The most common adverse events associated with the use of Amrix include dry mouth, dizziness, fatigue, nausea, dyspepsia, and constipation. The drug's use is contraindicated in patients taking monoamine oxidase inhibitors, as well as those with arrhythmias, heart block or conduction disturbances, or congestive heart failure. It also should not be taken during the acute recovery phase of myocardial infarction.

CyPass Micro-Stent

The FDA approved Alcon's CyPass Micro-Stent, a micro-invasive surgical device indicated for patients with mild to moderate primary open-angle glaucoma in conjunction with cataract surgery.

The most common side effects associated with the device's use include best-corrected visual acuity loss, anterior chamber cell and flare, worsening of visual field mean deviation by 2.5 or more decibels, intraocular pressure (IOP) increase, and corneal edema.

Following the FDA's decision, Alcon CEO Mike Ball stated that CyPass Micro-Stent "will provide a less-invasive means of lowering IOP than traditional glaucoma surgery." He also expressed hope that device would lower patients' dependence on topical glaucoma medication.

Oseltamivir Phosphate

In preparation for the flu season, the FDA approved Natco Pharma's oseltamivir phosphate. This generic version of Roche's Tamiflu is indicated for the treatment of influenza types A and B in patients 2 weeks and older who have had flu symptoms for no more than 48 hours. It can also be used to prevent flu in patients 1 year and older. The FDA emphasized that Tamiflu and its generic are not replacements for an annual flu shot. The agency also noted that the drug does not treat or prevent illness caused by infections other than the influenza, or prevent bacterial infections that may occur with the flu. Further research is needed to establish oseltamivir phosphate's effectiveness in patients who start treatment after 2 days of developing symptoms or in those with weakened immune systems.

Natco Pharma’s generic version of Tamiflu will be available in 30 mg, 45 mg, and 75 mg oral capsules.

Qbrelis

The FDA recently approved Silvergate Pharmaceuticals’ lisinopril oral solution (Qbrelis) for the treatment of hypertension in adults and children 6 years and older. The angiotensin-converting enzyme inhibitor is also indicated for the reduction of signs and symptoms of systolic heart failure, as well as for the reduction of mortality in hemodynamically stable patients within 24 hours of acute myocardial infarction.

The first lisinopril oral solution to receive the agency’s nod, Qbrelis allows for the use of weight-based dosing in children 6 years and older. The drug is also a boon to patients who have difficulty swallowing tablets.

Adverse events associated with the use of Qbrelis include headache, dizziness, and cough in hypotension patients, chest pain in trial participants with systolic heart failure, and renal dysfunction in those with acute myocardial infarction. The drug was approved with a boxed warning alerting patients and providers to a risk of fetal toxicity

Meditation, yoga and vegetarian diet linked to Inflammation and cardiovascular disease risk Free Press Journal

Curated by - Rohit Katariya (S Y B Pharm) Guided by Revan Karodi

In a novel controlled clinical trial, participants in a six-day The findings, published in the September 9 issue of Scientific Reports, represent a rare attempt to use metabolic biomarkers to assess the reported health benefits of integrative medicine and holistic practices. Senior author of the study, which included researchers from multiple institutions, was Deepak Chopra, MD, clinical professor in the Department of Family Medicine and Public Health at University of California San Diego School of Medicine and a noted proponent of integrative medicine.

"It appears that a one-week Panchakarma program can significantly alter the metabolic profile of the person undergoing it," said Chopra, whose foundation provided and managed funding for the study. "As part of our strategy to create a framework for whole systems biology research, our next step will be to correlate these changes with both gene expression and psychological health."

Study co-author Paul J. Mills, PhD, professor of family medicine and public health and director of the Center of Excellence for Research and Training in Integrative Health, both at UC San Diego School of Medicine, noted that alternative and integrative medicine practices, such as meditation and Ayurveda, are extremely popular, but their effects on the human microbiome, genome and physiology are not fully understood. "Our program of research is dedicated to addressing these gaps in the literature."

"The researchers looked at the effects of a Panchakarma-based Ayurvedic intervention on plasma metabolites in a controlled clinical trial," said first author Christine Tara Peterson, PhD, a postdoctoral fellow at UC San Diego School of Medicine. "Panchakarma refers to a detoxification and rejuvenation protocol involving massage, herbal therapy and other procedures to help strengthen and rejuvenate the body."

The study involved 119 healthy male and female participants between 30 and 80 years of age who stayed at the Chopra Center for Wellbeing in Carlsbad, Calif. Slightly more than half were assigned to the Panchakarma intervention (the Chopra Center's Perfect Health program, which typically costs $2,865 for a six-day treatment). The remainder to a control group. Blood plasma analyses, using liquid chromatography and mass spectrometry, were taken before and after the six-day testing period.

The researchers found that in the Panchakarma group there was a measurable decrease in 12 specific cell-membrane chemicals (phosphatidylcholines) correlating with serum cholesterol and inversely related to Type 2 diabetes risk.

"These phospholipids exert broad effects on pathways related to inflammation and cholesterol metabolism," said Peterson. "Plasma and serum levels of the metabolites of phosphatidylcholine are highly predictive of cardiovascular disease risk."

Application of a less stringent measurement standard identified 57 additional metabolites differentially abundant between the two groups of participants. The authors suggested that given the very short duration of the trial, the serum profile changes were likely driven by the vegetarian diet component of Panchakarma. They said further studies were needed to more fully understand the processes and mechanisms involved.

Conclusion (Rohit Katariya)

Panchakarma can help by reversing these negative effects of daily living. It can restore your natural state of health and wellness by cleansing your body of toxins, bringing balance into your system and improving bodily function. It can also help you sustain this process by making positive changes in lifestyle.

The Panchakarma therapeutic process appears quite simple in its application. However, its effects are powerful and long-lasting. Panchakarma is a unique, natural, holistic, health-giving series of therapeutic treatments that cleanse the body’s deep tissues of toxins, open the subtle channels, and bring life-enhancing energy thereby increasing vitality, inner peace, confidence and well-being.

Conclusion (Revan Karodi)

Senior author Deepak Chopra, MD, and Mills, PhD, noted that alternative and integrative medicine practices, such as meditation and Ayurveda, are extremely popular, but their effects on the human microbiome, genome and physiology are not fully understood. Panchakarma refers to a detoxification and rejuvenation protocol involving massage, herbal therapy and other procedures to help strengthen and rejuvenate the body.

Nutraceuticals, food supplements no longer considered proprietary foods by FSSAI ET Bureau

Curated by Praveen Praveen Zure (S Y B Pharm)

Conclusion edited by Revan Karodi

NEW DELHI: Nutraceuticals and health and dietary supplements such as fortified foods and energy drinks will no longer be considered proprietary food by India's regulator, according to revised rules, and they will likely have to be approved as a separate category.

The Food Safety and Standards Authority of India (FSSAI) has amended regulations to fix loopholes in the definition of proprietary food, under which approval had been sought for several nutraceutical and health supplements as proprietary foods. According to the FSSAI's new regulations uploaded on its website on January 25, proprietary food is now defined as "...an article of food that has not been Standardised under these (Food Safety and Standards) regulations, but does not include any novel food, food for special dietary use, functional food, nutraceutical, health supplement and such other articles of food which the Central Government may notify in this behalf."

The regulations specify that "the Food Business Operator shall be fully responsible for the safety of the proprietary food."

"Proprietary food shall use only such additives as specified for the category to which the food belongs and such category shall be clearly mentioned on the label along with its name, nature and composition," according to the regulations known as the Food Safety and Standards (Food Products Standards and Food Additives) Amendment Regulations,

"Nutraceuticals and food supplements will now have to be approved under the regulations for nutraceuticals," an FSSAI official said. India's nutraceuticals market is estimated to cross $6.1 billion by 2020 from $2.8 billion, according to a study by the Associated Chambers of Commerce & Industry of India and market research firm RNCOS in August. Nutraceuticals can be classified as Dietary supplements, including vitamins and minerals, and functional food and beverages such as those fortified with omega fatty acids and probiotics and energy and sports drinks.

Conclusion (Praveen)

FSSAI's new regulations uploaded on its website, has changed the way proprietary food shall be defined. The safety responsibility too for the same shall now be of the Food Business Operator. "Proprietary food shall use only such additives as specified for the category to which the food belongs and such category shall be clearly mentioned on the label along with its name, nature and composition," according to the regulations known as the Food Safety and Standards (Food Products Standards and Food Additives) Amendment Regulations. Nutraceuticals can be classified as Dietary supplements, including vitamins and minerals, and functional food and

beverages such as those fortified with omega fatty acids and probiotics and energy and sports drinks.

The FSSAI has re defined “proprietary food” with inclusion of standardized, non-standardized and novel foods. The onus of the safety and duly labeling shall now be of the Food Business Operator with regards to additives and category along with its name, nature and composition. Nutraceuticals can also be classified as Dietary supplements, including vitamins and minerals, and functional food and beverages such as those fortified with omega fatty acids and probiotics and energy and sports drinks.

Allopathy Vs Homeopathy, Padma Bandaru

Curated by - Bhagyashree Behera. (S Y B Pharm)
Guided by Dr Devendra Shirode

"Health and Intellect are two blessings of life." −

In modern day, health is the major concern for all people. As science and Technology is developing day by day many inventions of medical sciences are made. It is common knowledge that contemporary medicines, while abetting the recovery of the damaged organs of human body can negatively influence the sound ones. In medicine this phenomenon is called side effect, which basically treats one part of the body by creating malfunctions in the other one. Some of the modern medicines have such side effects. This is why people prefer Homeopathy or Ayurvedic than Allopathy.

With the raise of popularity in alternate medicines, one of the biggest current debates is the efficiency of Homeopathic medicine when contrasted with Allopathy medicine. While both have common goal of healing the sick, both achieve that goal by different means. Homeopathy is derived from Greek words, that means "similar" and "disease" which makes it "similar to disease". It is method of therapy appeared more than 200 years ago and it is a method of treatment, which belongs to regulate types of therapy. Its main advantage is that it helps the organism cope with the disease by itself by improving the immune system of the body. Ordinary medicines either suppress or agitate certain processes in the body, while homeopathic simply regulate these process they treat that person not the disease itself.

Allopathy is derived from the Greek word which means "other than the disease". It is actually coined by the creator of Homeopathy practice. Samuel Hahnemann in the 19th century as a word to describe main stream medical care. He coined it in order to set Homeopathy apart from the common treatment course of the time in order to highlight the differences in care. Homeopath practitioners used the term allopathic in a derogatory manner to describe conventional medicine throughout the 19th century. Coming to Homeopathy Vs Allopathy both follow different concepts. In Homeopathy the differences between any two individuals react to similar disease are an indication of the unique way in which each of them react. This uniqueness of the symptoms & reactions brings in difference in the remedy prescribed to each of them. Where as in Allopathy is based on that disease can be treated with the help of drugs. It only process on symptoms but not the causes. Homeopathy medicines are always prescribed on the basis of individualization i.e., the medicine will change for different persons.

Whereas in Allopathy there is no individualization if two persons are suffering from same disease then they have common medicine for both of them.

Coming to side effects Homeopathic medicines have no side effects, but it is well known fact that anything taken in excess is bound to be harmful. So, if you take them excess due to negligence or thinking them as placebo it may cause harmful effects. Whereas Allopathy has its own side effects either internal or external effects connected with every prescribed medicine.

Conclusion (Bhagyashree Behera)

With the raise of popularity in alternate medicines, one of the biggest current debates is the efficiency of Homeopathic medicine when contrasted with Allopathy medicine. Each has got its advantages and disadvantages. Ordinary medicines either suppress certain processes in the body, while homeopathic tries to free the person of the disease. While each is effective in its own way it is best that the physician decides on the course of action

Conclusion (Revan Karodi)

With alternate medicines becoming the order of the day, one of the biggest current debates is the efficiency of Homeopathic medicine when contrasted with Allopathy medicine. With each having its main advantage Homeopath helps the organism cope with the disease by itself by improving the immune system of the body. Allopathy on the other hand reduces symptoms very fast.