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As a result it also became the host for Beyond Biodevastation, the fifth grassroots gathering to celebrate biodiversity and question genetic engineering. Events included a two-day teach-in featuring world-class speakers from nearly every continent; a colorful, spirited march of about people protesting various aspects of genetically modified organisms; and a variety of creative direct actions designed to educate the public and challenge conventional thinking about genetic engineering. The name of the Sunshine Project refers to the fact that many biological weapons are quickly broken down and rendered harmless by exposure to bright sunlight. The Project conducts research, does international advocacy and alliance-building work, and provides education via publications, press releases and seminars. It is seeking a global ban on the use of biological agents in forced crop eradication, is working to reinforce international consensus against biological weapons, is raising questions about certain uses of genetic engineering in defensive biological weapons research, and is sparking much-needed public debate on the limits of military use of biotechnology and dangers of some types of defensive research conducted in western countries. Hammond began the presentation at Beyond Biodevastation by briefly reviewing how biological weapons are as old as warfare: As Hammond explained, the recent biotechnology revolution has increased the threat of biowarfare. Genetically engineered bioweapons in the form of lethal microbes that have no cure, are invisible to detection systems, and are able to overcome vaccines have been reported in scientific publications. Biotechnology allows researchers to build completely new types of biological weapons. Through genetic engineering, bacteria can not only be made resistant to antibiotics or vaccines, they can also be made even more toxic, harder to detect or more stable in the environment. One of the most advanced threats to the global consensus against biological weapons is the attempt to deploy biological agents in forced drug eradication. Fungi that attack drug-producing plants have been developed for use against coca, cannabis and the opium poppy. These agents are lowering the political threshold for use of biological weapons and are likely to have tremendous environmental and health impacts. Pursuit of crop-killing fungi or material-degrading microbes as weapons could easily lead to the use of other plant pathogens, animal pathogens or even non-lethal biological weapons against humans. In the same way, the use of genetically modified organisms GMOs in consumer products will help to increase public acceptance for application of biotechnology to war. The unknown consequences of unleashing GMOs into the environment is of enormous concern to thousands of activists around the world. Genetically engineered food crops have been burned and uprooted in India, Europe and South America, and resistance to GMOs is finally beginning in the U. Just as the pollen from corn genetically modified to include a pesticide can kill monarch butterflies, fungi for drug eradication are likely to attack wild relatives of the drug producing plants in their natural ecosystems. Once this genetic material is introduced into the environment, there is no way to know what mutations may occur and no way to control it. Contrary to the reassurances of the biotech industry, this is not a predictable technology. While the BTWC is very broad and unambiguous in its prohibition of all biological weapons, it lacks any provisions to verify that countries are in compliance. Early in the s, it became apparent that the former Soviet Union, Iraq and the former apartheid regime in South Africa engaged in offensive warfare programs. These revelations were instrumental in triggering negotiations for a legally binding protocol to strengthen the Convention. The protocol would provide for verification measures such as laboratory inspections and export notifications. Two razor-thin distinctions complicate these efforts. Nearly all the knowledge, techniques and equipment necessary for an offensive biological warfare program is dual-use technology because it is also applicable to civilian medical or biological research. Furthermore, as with all military development, a very thin line separates offense and defense bioweapons research. Much greater public awareness about these alarming developments is needed. Hammond concluded his presentation by describing some of the genetic engineering that is regularly used to produce lethal bacteria, including bacteria causing unusual symptoms thereby obscuring diagnosis and delaying therapy , transferring a lethal factor into harmless human gut bacteria, antibiotic-resistant anthrax and tularemia, and "invisible" anthrax altering immunogenicity to not only overcome vaccinations but also detection systems. He also briefly discussed crowd-control chemical technologies such as malodorants and calmatives and mentioned the theory among some activists that the virulent anti-Western sentiment currently expressed by the Taliban may be the result of a mind-altering chemical weapon deployed in Afghanistan during its occupation by the USSR. More information about the types of biological weapons that are being developed is available at the Web site, www.

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Chapter 2 : Singapore Biotech & Pharma Companies Directory

biotechnology innovation is characterized by agglomeration and interaction in local clusters while at the same time being connected to global networks (Moodysson,).

The announcement, followed quickly by the unveiling of the MACRA framework that focuses on alternative payment models APMs for quality care improvements, led many providers to start investigating the switch to value-based care. But the transition is not an easy one for many organizations. Value-based reimbursement models require extensive data analytics capabilities, population health management programs, and the ability to successfully use electronic health records for documentation and reporting. CMS plans for shifting to value-based reimbursement Source: CMS Fortunately for providers, alternative payment models come in a variety of shapes and sizes to suit a number of different needs and competency levels. Providers can select the most appropriate model based on their health IT capabilities and healthcare spending trends and continue to work their way up the continuum to achieve full value-based care. What are some of the value-based reimbursement options available to providers, and how do they impact potential revenue? Starting on the path to value-based reimbursement For providers dipping their toes in the value-based care pool, pay-for-performance models offer a straightforward approach to linking claims reimbursement to quality and value. Under these models, providers are typically reimbursed for services using a fee-for-service structure, but they can also qualify for value-based incentive payments or penalties based on quality and cost performance. CMS assesses participants using a myriad of measures, such as influenza immunization rates, Medicare spending per beneficiary, and performance on patient experience surveys. Depending on how hospitals score on the measures relative to their established baselines and if they have improved their performance, providers can either earn financial rewards on top of their fee-for-service payments or see their Medicare revenue decrease. Pay-for-performance models benefit small and rural practices that need time and resources to implement value-based care. Pay-for-performance arrangements do not require as much familiarity with robust health IT and data analytics infrastructure compared to other alternative payment models, making them popular among small practices that do not have the resources to implement expensive technologies. However, providers do need to have the ability to monitor and report clinical quality and cost data. The model also does not involve financial risk, meaning providers are not liable to repay any financial losses. While some critics have argued that pay-for-performance structures do not offer large enough incentives to change physician behaviors, an August study from the American Journal of Managed Care found that financial penalties alter behavior to a greater degree than other quality improvement programs, such as public reporting. Preparing the Healthcare Revenue Cycle for Value-Based Care Taking the next step with shared savings alternative payment models Shared savings arrangements offer providers a higher level of financial reward than pay-for-performance models. Providers are reimbursed under a fee-for-service model, but if a provider can reduce healthcare spending below an established benchmark set by the payer, then he can retain a portion of the savings produced. Bundled payments are a common example of how shared savings are incorporated in value-based reimbursement models. Under a bundled payment structure, providers are paid a fixed amount for all the services performed to a treat a patient during an episode of care, such as a specific condition i. However, if healthcare costs exceed the set amount, providers lose out on the revenue they would have received from a traditional payment structure. Medicare launched a bundled payment program for 48 types of episodes of care in The Bundled Payments for Care Improvement Initiative aims to improve care coordination and decrease healthcare spending by reimbursing providers for furnishing care from the healthcare encounter initiation to up to 90 days of post-acute care, depending on the specific payment track. Participants are either paid on a retrospective or prospective basis and they can share a specified an amount of any savings generated with CMS. Shared savings programs, however, can be difficult for providers to initiate and sustain. Providers may need to invest their own resources into the health IT and care delivery systems necessary to track healthcare spending, quality improvement, and care coordination. Shared savings payments also may not reimburse providers for related services, such as phone calls with patients and other providers, email consultations, and nurse care managers. The alternative payment model may also be difficult to sustain because providers are generally assessed based on a historical benchmark. Once healthcare costs are low, they must remain low or be further reduced to realize shared savings. Despite some shortcomings, shared savings agreements are better suited for healthcare facilities that may have high rates of healthcare spending, hospital admissions, and resource use. These providers have the most opportunity to improve quality and cost performance, therefore they are eligible to earn greater shared savings compared to more cost effective facilities.

Chapter 3 : Latest Industry News in - Singapore Biotech & Pharma Guide

mdu Gerstein Daniel M. Daniel M. Gerstein Annapolis, Md. Naval Institute Press Bioterror in the 21st century.

See Article History Bionics, science of constructing artificial systems that have some of the characteristics of living systems. Bionics is not a specialized science but an interscience discipline; it may be compared with cybernetics. Bionics and cybernetics have been called the two sides of the same coin. Mimicry of nature is an old idea. Many inventors have modeled machines after animals throughout the centuries. Copying from nature has distinct advantages. Most living creatures now on the Earth are the product of two billion years of evolution , and the construction of machines to work in an environment resembling that of living creatures can profit from this enormous experience. Although the easiest way may be thought to be direct imitation of nature, this is often difficult if not impossible, among other reasons because of the difference in scale. Bionics researchers have found that it is more advantageous to understand the principles of why things work in nature than to slavishly copy details. The next step is the generalized search for inspiration from nature. Living beings can be studied from several points of view. Animal muscle is an efficient mechanical motor; solar energy is stored in a chemical form by plants with almost percent efficiency; transmission of information within the nervous system is more complex than the largest telephone exchanges; problem solving by a human brain exceeds by far the capacity of the most powerful supercomputers. These exemplify the two main fields of bionics researchâ€”information processing and energy transformation and storage. The general pattern of the information network of living organisms is the following: Pit vipers of the subfamily Crotalinae which includes the rattlesnakes , for example, have a heat-sensing mechanism located in a pit between nostrils and eyes. Though much more sensitive man-made infrared detectors exist, bionics can still profit from study of the vipers. Another striking example is the odour-sensing organ of the silk moth, Bombyx mori. The male can detect the chemical secreted by the female in a quantity as small as a few molecules. In a conductor such as a telephone wire, the signal is attenuated as it travels along the wire, and amplifiers must be placed at intervals to reinforce it. This is not the case for the animal nerve axon: This impulse can travel in only one direction. These properties make the nerve axon capable of logic operations. In a semiconductor device called a neuristor was devised, capable of propagating a signal in one direction without attenuation and able to perform numerical and logical operations. The neuristor computer, inspired by a natural model, imitates the dynamic behaviour of natural neural information networks; each circuit can serve sequentially for different operations in a manner similar to that of the nervous system. Another question of interest to bionics is how a living system makes use of information. In changing circumstances, humans evaluate alternative courses of action. Every situation somehow resembles a situation experienced before. One way to design an artificial machine capable of pattern-recognition properties is to use learning processes. Experimental versions of such a machine have been developed; they learn by establishing and modifying connections among a large number of possible alternative routes in a net of pathways. This learning, however, is still rudimentary and far from human. The first essential difference between existing electronic computers and the human brain lies in the way their memories are organized. In either the memory of a living being or that of a machine, the main problem lies in retrieving information once it has been stored. It is possible to find a certain piece of information if the addressâ€”that is, the number of the pigeonholeâ€”is known. The human memory works in a very different way, using association of data. Information is retrieved according to its content, not according to an external address artificially added. That difference is qualitative as well as quantitative. Man-made memory devices are now constructed using associative principles, and there is a great potential in this field. The second main difference between electronic computers and the human brain resides in the manner of dealing with the information. A computer processes precise data. Humans accept fuzzy data and carry out operations that are not strictly rigorous. Also, computers perform only very simple elementary operations, producing complex results by performing a vast number of such simple operations at very high speed. In contrast, the human brain performs at low speed but in parallel rather than in sequence, producing several simultaneous results that can be compared see also artificial intelligence. In the living world, energy is stored in the form of chemical compounds; its use always is accompanied by chemical reactions. Solar energy is stored by plants by means of complex chemical processes. The energy of muscular motion is derived from chemical changes. The light produced by such living organisms as mushrooms, glowworms, and certain fishes is of chemical origin. In every case the energy transformation is remarkably efficient compared with thermal engines. A beginning is being made in understanding how these transformations take place in living material and the nature of the complex role played by living membranes. Perhaps some of the limitations of molecular complexity and fragility could be overcome in man-made artificial-energy machines and better results achieved than in natural membranes. Learn More in these related Britannica articles:

Chapter 4 : Energy for Life | Guest Hollow's Homeschool Biology Curriculum

Two sides of the same coin November 9, The simple transport of drugs directly into cells is one of the primary goals of the pharmaceutical industry.

Received Jun 6; Accepted Jul The use, distribution or reproduction in other forums is permitted, provided the original author s or licensor are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms. This article has been cited by other articles in PMC. The urgency of moving ahead in the field is not merely dictated by scientific interests; such need has indeed become a frequent and central item in the agendas of public health authorities Guralnik et al. In fact, there is a growing demand for the identification of effective solutions against the detrimental consequences that age-related conditions in particular, disabilities exert on our healthcare systems. Special attention has been given to sarcopenia Janssen et al. Nevertheless, the skeletal muscle cannot be isolated by the hosting organism. As such, it is still subject to the influence of all the positive and negative stressors to which the organism is exposed. In other words, the endogenous and exogenous phenomena capable of modifying the aging trajectory of the organism can also more or less directly influence the quality and quantity of the muscle. Different operational definitions have been proposed for capturing the frailty status, each one focusing on specific aspects of the syndrome and detecting slightly different risk profiles Theou et al. Nevertheless, there is an overall agreement about the key role that physical function in particular, mobility plays in the determination of the status of extreme vulnerability Ferrucci et al. Since the beginning roughly about 15â€”20 years ago , sarcopenia and frailty have been studied in parallel. Being organ-specific, sarcopenia was more frequently object of research in basic science, whereas the concept of frailty tended to be more easily applied in the clinical setting Bauer and Sieber, However, it was quite inevitable that the two would have sooner or later started converging due to their close relationship with the aging process. Unfortunately, the definition of a clear framework within which sarcopenia and frailty can be accommodated and studied has yet to come. One major issue in this context is the long-lasting, tiring, and potentially pointless controversy about the causal relationship existing between the two. Yet, the isolation of a single pathophysiological determinant responsible for these complex conditions as well as for any other age-related process is quite unlikely to be obtained, simply because aging is a complicated and still largely unknown phenomenon Cesari et al. By stating this, we are not surrendering to the current limitations of science. We are instead soliciting the taking of more pragmatic decisions on this topic, waiting that next-to-come scientific advancements allow a better clarification and definition of such urgent and pivotal matters. By this way, we might have the opportunity to 1 define a unique target for both sarcopenia and frailty, 2 simplify their operational definition, and 3 promote the implementation of the two conditions in both clinical and research settings. Such impairment may be responsible for the concurrent existence of a disability as well as represent a consequence of it. It is indeed the presence of disability that influences the framing under which the sarcopeniaâ€"frailty relationship should be observed. In such situation, sarcopenia rather tends to assume the lineaments of cachexia Rolland et al. This scenario of tertiary prevention requires the treatment of disability plus ancillary interventions aimed at reducing the risks of complications Gordis, The physical function impairment resulting from the combination of sarcopenia and frailty assumes completely different aspects when detected in the absence of disability. In this case, it will represent the first preliminary stage of a process potentially driving the individual toward more severe functional losses and incapacities. In other words, by acting in the preclinical phase of the illness, it will define an ideal target for activities of secondary prevention against disability Gordis,

Chapter 5 : Varsity starts Biotech dept

After this was removed a second look revealed a 5-cent Euro coin (diameter mm) at the same level. This was also removed. During endoscopy the two coins were not simultaneously evident and the second coin was only visualised on a second inspection. Figure 2 demonstrates the two coins side-by-side after removal.

You can often see energy at work in living thingsâ€”a bird flies through the air, a firefly glows in the dark, a dog wags its tail. These are obvious ways that living things use energy, but living things constantly use energy in less obvious ways as well. Why Living Things Need Energy Inside every cell of all living things, energy is needed to carry out life processes. Energy is required to break down and build up molecules and to transport molecules across plasma membranes. A lot of energy is also simply lost to the environment as heat. The story of life is a story of energy flowâ€”its capture, its change of form, its use for work, and its loss as heat. Energy, unlike matter, cannot be recycled, so organisms require a constant input of energy. Life runs on chemical energy. Where do living organisms get this chemical energy? How Organisms Get Energy: Autotrophs and Heterotrophs The chemical energy that organisms need comes from food. Food consists of organic molecules that store energy in their chemical bonds. In terms of obtaining food for energy, there are two types of organisms: Autotrophs Autotrophs are organisms that make their own food. Most autotrophs use the energy in sunlight to make food in a process called photosynthesis. Only three types of organismsâ€”plants, algae, and some bacteriaâ€”can make food through photosynthesis. Photosynthetic autotrophs, which make food using the energy in sunlight, include a plants, b algae, and c certain bacteria. Autotrophs are also called producers. They produce food not only for themselves but for all other living things as well which are known as consumers. A food chain shows how energy and matter flow from producers to consumers. Matter is recycled, but energy must keep flowing into the system. Where does this energy come from? Click the link below to build a marsh food web: They may consume autotrophs or other heterotrophs just like YOU can eat meat -heterotrophs, and plants â€” autotrophs. Heterotrophs include all animals and fungi and many single-celled organisms. What do you think would happen to consumers if all producers were to vanish from Earth? Glucose and ATP Organisms mainly use two types of molecules for chemical energy: Both molecules are used as fuels throughout the living world. Both molecules are also key players in the process of photosynthesis. Glucose Glucose is a simple carbohydrate with the chemical formula $C6H12O6$. It stores chemical energy in a concentrated, stable form. In your body, glucose is the form of energy that is carried in your blood and taken up by each of your trillions of cells. Glucose is the end product of photosynthesis, and it is the nearly universal food for life. ATP is made during the first half of photosynthesis and then used for energy during the second half of photosynthesis, when glucose is made. It is also used for energy by cells for most other cellular processes. ATP releases energy when it gives up one of its three phosphate groups and changes to ADP adenosine diphosphate [two phosphates]. ATP is now Mr. ADP since he just released some energy by shooting off a phosphate. Glucose is also more stable than ATP. Therefore, glucose is better for storing and transporting energy. However, glucose is too powerful for cells to use. ATP, on the other hand, contains just the right amount of energy to power life processes within cells. For these reasons, both glucose and ATP are needed by living things. Making and Using Food The flow of energy through living organisms begins with photosynthesis. This process stores energy from sunlight in the chemical bonds of glucose. By breaking the chemical bonds in glucose, cells release the stored energy and make the ATP they need. Photosynthesis and cellular respiration are like two sides of the same coin. The products of one process are the reactants of the other. Together, the two processes store and release energy in living organisms. This diagram compares and contrasts photosynthesis and cellular respiration. It also shows how the two processes are related. Photosynthesis Photosynthesis is often considered to be the single most important life process on Earth. It changes light energy into chemical energy and also releases oxygen. Without photosynthesis, there would be no oxygen in the atmosphere. Photosynthesis involves many chemical reactions, but they can be summed up in a single chemical equation: Photosynthetic autotrophs capture light energy from the sun and absorb carbon dioxide and water from their environment. Using the light energy, they combine the reactants to produce glucose and oxygen, which is a waste product. They store the glucose, usually as starch, and they release the oxygen into the atmosphere. This is because it releases the energy in glucose slowly, in many small steps. It uses the energy that is released to form molecules of ATP. Cellular respiration involves many chemical reactions, which can be summed up with this chemical equation: It takes place in the cells of both autotrophs and heterotrophs. All of them burn glucose to form ATP. Watch this animation that explains cellular respiration:

Chapter 6 : How do peptides penetrate cells? Two sides of the same coin

Block's ultimate nightmare is that terrorists could somehow get access to the smallpox viruses being kept on ice at the Russian State Research Center of Virology and Biotechnology -- a fear.

Chapter 7 : Reflections from the CSU Annual Biotechnology Symposium | The CSUPERB Blog

By this way, we might have the opportunity to (1) define a unique target for both sarcopenia and frailty, (2) simplify their operational definition, and (3) promote the implementation of the two conditions in both clinical and research settings.

Chapter 8 : Understanding the Value-Based Reimbursement Model Landscape

But in reality, the numbers are actually two sides of the same coin: A startling portion of the world does not have access to reliable, nutrient-rich food.

Chapter 9 : Sarcopenia and Physical Frailty: Two Sides of the Same Coin

For pharma, volatility and value are two sides of the same coin The Business Times by ANNABETH LEOW Singapore FOR the four months to July, Singapore's export-oriented drug industry notched up double-digit yearly growth, while July exports surged a stunning per cent - yet industry players are hard put to forecast a consistent trajectory.