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CONTENTS

Issue 240

5118 కలి కాలము/Kali Era| 2074 విక్రమార్క కాలము/Vikramarka Era| 1938 శాలివాహన కాలము/Salivahana Era
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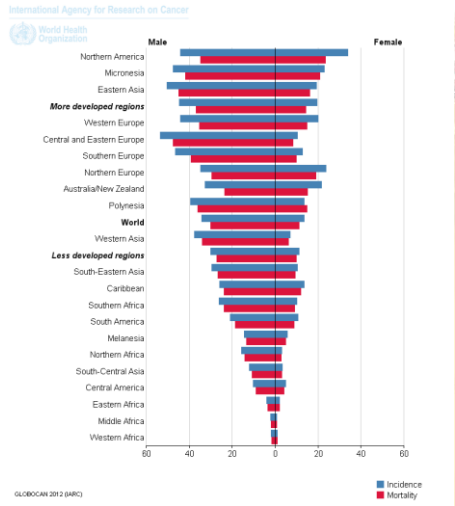
RISK OF LUNG CANCER[1]

Approximately 415,000 Americans living today have been diagnosed with lung cancer at some point in their lives. Although there is no sure way to prevent lung cancer, there are plenty of ways to reduce the risk of getting cancer.



1. Don't EVER Smoke. If you've never smoked, don't start now. Make sure to talk to your children about the dangers of smoking and give them the tools they need to stand up to peer pressure.
2. Quit Smoking. Quitting smoking greatly reduces the smoker's risk of developing lung cancer. Options may include nicotine replacement products, medications and support groups.
   a. The quit day. Purge the home, car and workplace of all tobacco products - any temptations. Having a support system around helps to quit smoking successfully -enlist the help and support of family and friends to keep it on track.
   b. Support groups. Attend a smoking cessation program in your area. Talk with your doctor about what programs are right for you.
   c. Smoking cessation aids. Talk to your doctor about smoking cessation aids. There are a number of smoking cessation aids out there. Whether you choose gum, the patch or medication, talk to your doctor about helping you lessen your withdrawal symptoms.
   d. Avoid secondhand smoke. Ask smokers around to smoke outside and avoid areas where people smoke. Ask to be seated in the non-smoking section in restaurants and bars, or avoid them altogether.
3. Test for radon. The radon levels at home should be checked periodically. Local public health department or a local chapter of the American Lung Association should have information on radon testing.
4. Avoid carcinogens. While working around carcinogens, take precautions to protect yourself. Follow your employers posted precautions. If you're given a face mask, wear it. Ask your doctor how to better protect yourself while on the job.

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5. Eat plenty of fruits and vegetables. Choose a healthy diet full of fruits and vegetables. Foods that are rich in vitamins and nutrients are best. Avoid taking large doses of vitamins in pill form. They can actually be more harmful.
6. Exercise. Exercise most days of the week.
7. Get Screened. Screenings are offered to those considered "high risk," including:
   - Those between the ages of 55-79 who have smoked the equivalent of one pack daily for 30 years.
   - Those between the ages of 55-79 who have smoked the equivalent of one pack daily for 20 years and have one additional risk factor including radon exposure, asbestos exposure, cancer history, strong family history of lung cancer, significant secondhand smoke exposure, chronic obstructive pulmonary disease (COPD) or pulmonary fibrosis.

Estimated numbers (thousands)[2]	Men			Women			Both sexes		
	Cases	Deaths	5-year prev.	Cases	Deaths	5-year prev.	Cases	Deaths	5-year prev.
World	1242	1099	1267	583	491	626	1825	1590	1893
More developed regions	490	417	593	268	210	341	758	627	933
Less developed regions	751	682	674	315	281	286	1066	963	960
WHO Africa region (AFRO)	12	11	10	6	6	5	18	16	15
WHO Americas region (PAHO)	178	149	208	146	113	175	324	262	383
WHO East Mediterranean region (EMRO)	26	23	22	7	6	6	33	29	28
WHO Europe region (EURO)	323	283	343	126	105	133	449	388	476
WHO South-East Asia region (SEARO)	116	104	79	46	42	34	162	146	113
WHO Western Pacific region (WPRO)	588	528	605	251	220	273	839	748	878
IARC membership (24 countries)	514	438	582	279	219	343	794	657	925
United States of America	112	92	140	102	76	128	214	168	269
China	459	422	431	193	175	179	653	597	610
India	54	49	24	17	15	8	70	64	32
European Union (EU-28)	214	186	234	99	82	106	313	268	340

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EXTINCTION AWAITS US[3]

In the cold upper atmosphere, when the water vapor condenses into liquid droplets or ice particles, it releases its heat and warms the atmosphere. NASA, Jet Propulsion Laboratory in Pasadena, California.

Tightening of tropical ascent and high clouds key to precipitation change in a warmer climate: Precipitation is vital to life on Earth. Global warming could exert a profound impact on global precipitation, ecosystems, and human society. The change of global-mean precipitation under global warming and interannual variability is predominantly controlled by the change of atmospheric longwave radiative cooling. NASA report shows that tightening of the ascending branch of the Hadley Circulation coupled with a decrease in tropical high cloud fraction is key in modulating precipitation response to surface warming. The magnitude of high cloud shrinkage is a primary contributor to the intermodel spread in the changes of tropical-mean outgoing longwave radiation (OLR) and global-mean precipitation per unit surface warming (d*P*/d*Ts*) for both interannual variability and global warming. Compared to observations, most Coupled Model Inter-comparison Project Phase 5 models underestimate the rates of interannual tropical-mean dOLR/d*Ts* and global-mean d*P*/d*Ts*, consistent with the muted tropical high cloud shrinkage. The five models that agree with the observation-based interannual d*P*/d*Ts* all predict d*P*/d*Ts* under global warming higher than the ensemble mean d*P*/d*Ts* from the ~20 models analyzed.

Climate change is a large-scale shift in the Earth's weather patterns and temperatures. As a result of such changes life changes, e.g., the UK's only endemic bird the Scottish crossbill found in the Highlands, where it feeds on pine seeds, is highly likely to become extinct because of the climate change, the State of the UK's Birds 2017 (SUKB) report.

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The report reveals how the distribution, numbers, and behavior of birds in the UK are altering because of a changing climate. Some species are already moving northwards in response to average summer temperatures that have increased by nearly 1C since the 1980s. Many rarer breeding birds are at a high risk of extinction, however, based on projections of how climate will become less suitable for them.

El Nino and Liquid Water Clouds Contribute to Antarctic Melt in 2015-2016. West Antarctica is one of the most rapidly warming regions on Earth, and this warming is closely connected with the global sea level rise.

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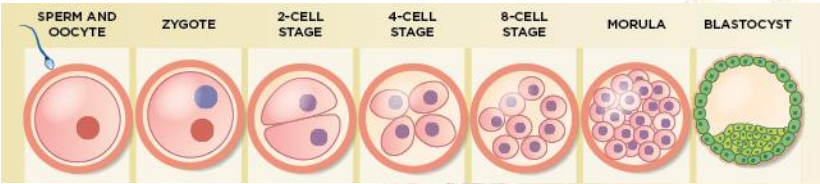
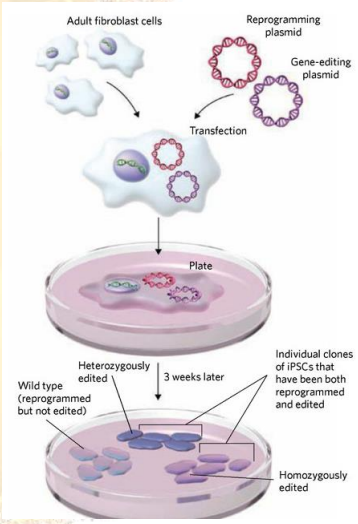
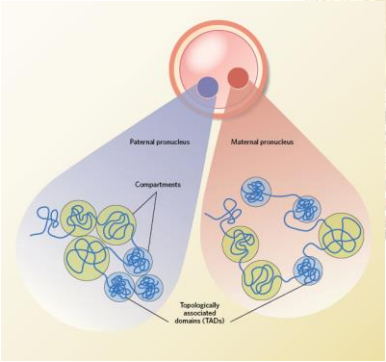
HUMAN EMBRYO IN A PETRI DISH[4]



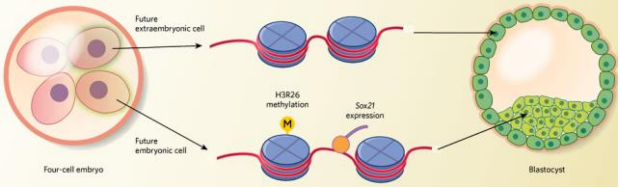
International regulations permit the study of human embryos in the lab for up to 14 days. So, researchers end experiments at 13 days post-fertilization to be compliant with the widely recognized 14-day rule[5]. The 14-day limit was first proposed in 1979 by the Ethics Advisory Board of the US Department of Health, Education, and Welfare[6]. It was endorsed in 1984 by the Warnock committee in the United Kingdom8, and in 1994 by the US National Institutes of Health's Human Embryo Research Panel[7].



In the first hours after fertilization, maternal factors residing in the oocyte cytoplasm dictate early development. But soon, the zygote's genes start to take over. This maternal-to-zygotic transition involves massive epigenetic reprogramming, from the overall structure of the chromatin to the complete resetting of methylation on the genome (Note: Most of the information depicted above is based on studies of mouse embryos; there are some differences in the timing of these events in human embryos).



A young embryo implants into the wall of the womb about seven days after fertilization. The first week of embryonic development is fairly straightforward to study in vitro; after that, it gets tricky. But a new blend of amino acids,



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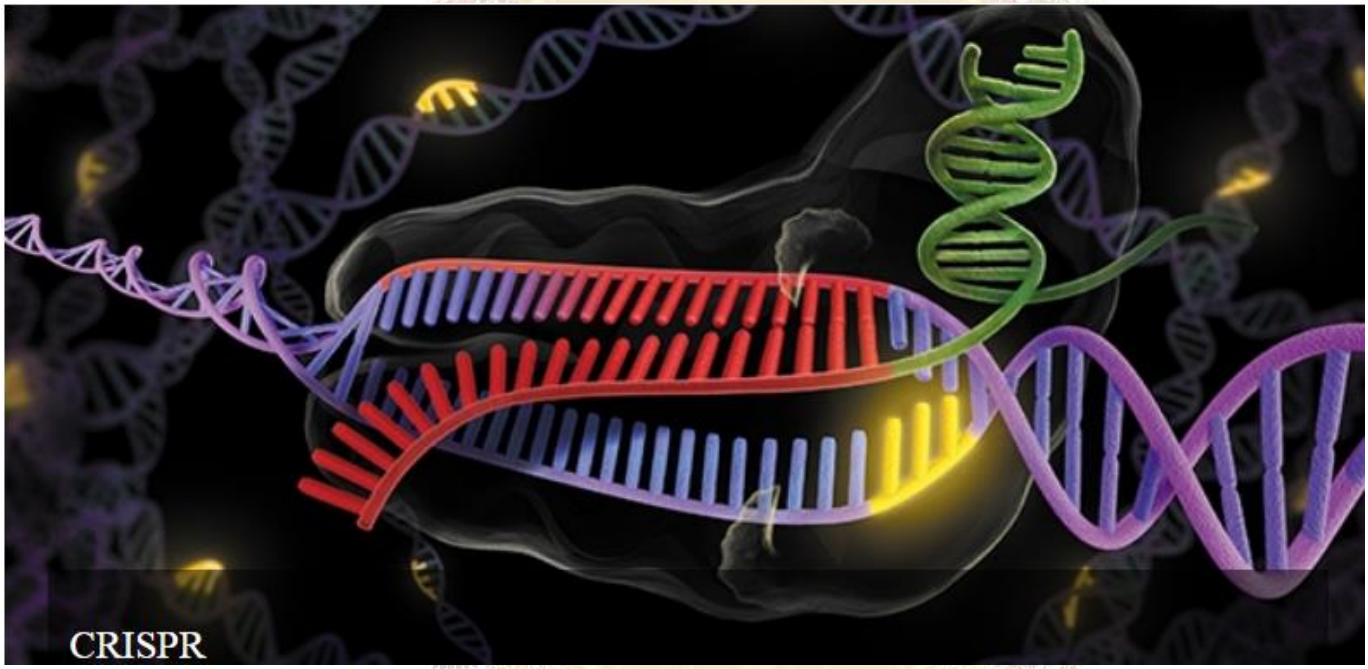
hormones, and growth factors now provides researchers with a way to keep human embryos alive in vitro for much longer[8]. The reorganization of the embryonic lineage is mediated by cellular polarization leading to cavity formation - self-organize into a cavity in the blastocyst - embryo-autonomous. The development of the embryo that normally takes place during early post-implantation development can be achieved in the lab given the right culture conditions[9], developed by scientists at the University of Cambridge.



The CRISPR zoo is expanding fast[10]!

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TOP HEALTH NEWS OF 2017: EPIDEMIC OF OPIOID ABUSE

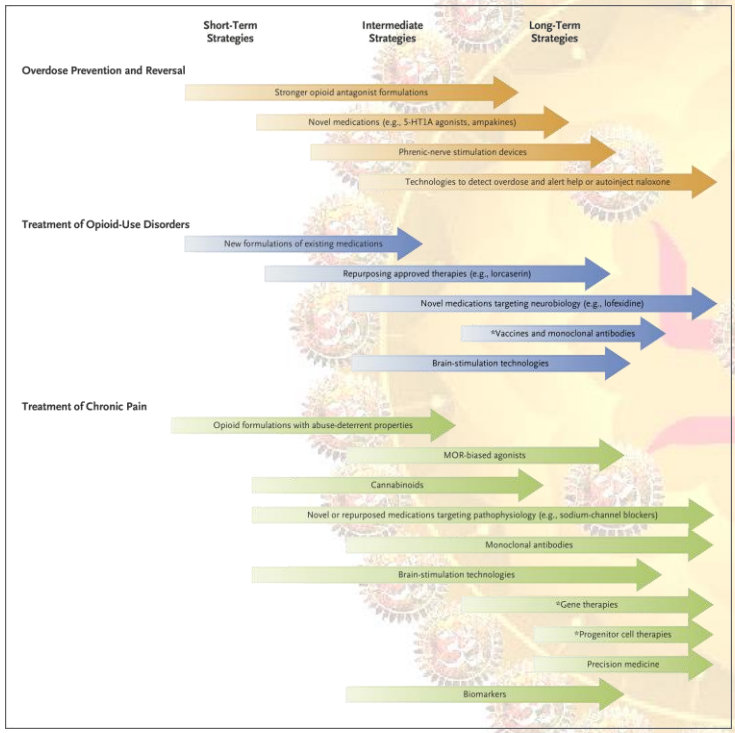
Millions of Americans caught in the grip of an addiction to opioids prescription painkillers or heroin was the leading health crisis stories of 2017. The Opioid Epidemic is a crisis years in the making[11]. Every day, more than 90 Americans die after overdosing on opioids[12] and a hundred and loss of life alone costs the economy a hundred and fifty billion dollars a year[13]. In 2015, about 2,000,000 people had a prescription opioid use disorder and 591,000 suffered from a heroin use disorder; About 63,600 Americans died from an opioid overdose[14] in 2016, higher than the 40,000 AIDS deaths in 1990 HIV crisis; while the number of crimes was 15696 murders, 90185 rapes, 327374 robberies, and 1197704 violent crimes, and property crimes resulted in losses estimated at $14.3 billion[15].

Opioids are medications that act on opioid receptors in both the spinal cord and brain to reduce the intensity of pain-signal perception. Opioids act by attaching to and activating opioid receptor proteins, which are found on nerve cells in the brain, spinal cord, gastrointestinal tract, and other organs in the body. They also affect brain areas that control emotion, which can further diminish the effects of painful stimuli. They have been used for centuries to treat pain, cough, and diarrhea.26 The most common modern use of opioids is to treat acute pain. However, since the 1990s, they have been increasingly used to treat chronic pain, despite sparse evidence for their effectiveness when used long term[16].

Central nervous system (CNS) depressants[17], a category that includes tranquilizers, sedatives, and hypnotics, are substances that can slow brain activity. This property makes them useful for treating anxiety and sleep disorders. Most CNS depressants act on the brain by increasing activity at receptors for the inhibitory neurotransmitter gamma-aminobutyric acid (GABA). Although the different classes of depressants work in unique ways, it is through their ability to increase GABA signaling—thereby increasing inhibition of brain activity—that they produce a drowsy or calming effect that is medically beneficial to those suffering from anxiety or sleep disorders. Benzodiazepines, such as diazepam (Valium®), clonazepam (Klonopin®), and alprazolam (Xanax®), are sometimes prescribed to treat anxiety, acute stress reactions, and panic attacks. Non-benzodiazepine sleep medications, such as zolpidem (Ambien®), eszopiclone (Lunesta®), and zaleplon (Sonata®), known as z-drugs, have a different chemical structure but act on the same GABA type A receptors in the brain as benzodiazepines. They are thought to have fewer side effects and less risk of dependence than benzodiazepines. Barbiturates, such as mephobarbital (Mebaral®), phenobarbital (Luminal®), and pentobarbital sodium (Nembutal®), are used less frequently to reduce anxiety or to help with sleep problems because of their higher risk of overdose compared to benzodiazepines. However, they are still used in surgical procedures and to treat seizure disorders. Despite their beneficial

therapeutic effects, benzodiazepines and barbiturates have the potential for misuse and should be used only as prescribed.

Dependence occurs as a result of physiological adaptations to chronic exposure to a drug. It is often a part of addiction, but they are not equivalent. Addiction involves other changes to brain circuitry and is distinguished by compulsive drug seeking and use despite negative consequences[18]. Those who are dependent on a medication will experience unpleasant physical withdrawal symptoms when they abruptly reduce or stop use of the drug. These symptoms can be mild to severe (depending on the drug) and can usually be managed medically or avoided by slowly tapering down the drug dosage[19].



In response to an an ongoing and rapidly evolving public health crisis, requiring innovative scientific solutions because no existing medication is ideal for every patient; the National Institutes of Health (NIH) has joined with private partners to launch an initiative in three scientific areas: developing better overdose-reversal and prevention interventions to reduce mortality, saving lives for future treatment and recovery; finding new, innovative medications and technologies to treat opioid addiction; and finding safe, effective, nonaddictive interventions to manage chronic pain. Each of these areas requires a range of short-, intermediate-, and long-term research strategies. The NIH has successfully partnered with industry to help develop new formulations of existing medications to improve compliance and reduce the potential for diversion[20].

Recent research points to the innate immune system's involvement in the unwanted side effects of opioid analgesics, with preclinical and clinical studies implicating glial responses in both tolerance and dependence.

Hopefully, new discoveries will soon enable us to change the opioid use and to consider new approaches to treating persistent pain[21].

Disclaimer[22]
For further information or support, please contact the editor[23].

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[1] Lung Cancer Prevention: 12 Tips to Reduce Your Risk http://www.newswise.com/articles/view/686496/?sc=dwhn
[2] THE GLOBOCAN PROJECT http://globocan.iarc.fr/Default.aspx; http://globocan.iarc.fr/Pages/fact_sheets_cancer.aspx?cancer=lung
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[23] Dr. Rao Vepachedu at **rao.vepachedu@cardinal-ip.com**.