医学简讯/Medicine Notes

Psychedelics Shown to Relieve Anxiety

In a widely publicized study released earlier this month, a Swiss research team led by Peter Gasser, M.D., of the Medical Office for Psychiatry and Psychotherapy in Solothurn, Switzerland, found that of 12 patients with life-threatening illnesses, all eight receiving the drug showed statistically significant reductions in standard anxiety measures. The study, published March 4 in The Journal of Nervous and Mental Disease, was the first published in some 40 years that evaluated LSD's safety and efficacy as an adjunct to psychotherapy.

(Cited from http://www.genengnews.com/insight-and-intelligence/psychedelics-shown-to-relieve-anxiety/77900076/)

First Fully Functional Yeast Chromosome Synthetically Designed

An international team of scientists reports the synthesis of the first functional chromosome in yeast. They point out that this marks an important step in the emerging field of synthetic biology, designing microorganisms to produce novel medicines, raw materials for food, and biofuels. Yeast chromosome Ⅲ was selected for synthesis because it is among the smallest of the 16 yeast chromosomes and controls how yeast cells mate and undergo genetic change. Yeast shares roughly a third of its 6 000 genes—functional units of chromosomal DNA for encoding proteins—with humans. The team was able to manipulate large sections of yeast DNA without compromising chromosomal viability and function using a so-called scrambling technique that allowed the scientists to shuffle genes like a deck of cards, where each gene is a card.

(Cited from http://www.genengnews.com/gen-news-highlights/first-fully-functional-yeast-chromosome-synthetically-designed/81249679/)

CRISPR Reverses Disease Symptoms in Living Animals for First Time

MIT scientists report the use of a CRISPR methodology to cure mice of a rare liver disorder caused by a single genetic mutation. They say their study ("Genome editing with Cas9 in adult mice corrects a disease mutation and phenotype"), published in Nature Biotechnology, offers the first evidence that this gene-editing technique can reverse disease symptoms in living animals. CRISPR, which provides a way to snip out mutated DNA and replace it with the correct sequence, holds potential for treating many genetic disorders, according to the research team.

(Cited from http://www.genengnews.com/gen-news-highlights/crispr-reverses-disease-symptoms-in-living-animals-for-first-time/81249682/)

Precision Medicine: New Opportunity in the Age of Cost-Conscious Medicine

Emerging technologies, big data, and increased pressure to contain health costs are creating a major opportunity for precision medicine. Diagnostic makers still face high hurdles to commercialization, but through better strategic planning and innovative collaboration they can embrace this opportunity and help make precision medicine a key tool in the push for more efficient healthcare delivery. Precision medicine can also become a key differentiator in an increasingly cost-conscious and competitive healthcare delivery landscape.

(Cited from http://www.genengnews.com/insight-and-intelligence/precision-medicine-new-opportunity-in-the-age-of-cost-conscious-medicine/77900105/)

Key Questions for Cell-Line Acquisition, Storage, and Usage

Asking a few simple questions of the source of your cell lines, be it a commercial vendor or colleague down the hall, and following several basic best practices can help ensure that cell lines are authentic and free of contamination.

Acquisition: How was the cell line authenticated? Is the cell line found in the ICLAC Cross-Contaminated or Misidentified Cell Line Database? Is the short tandem repeat (STR) profile known? Does the vendor supply a Certificate of Analysis (CofA) showing the STR profile of a cell? Has this batch been tested for mycoplasma? Are references and journal citations available for the cell lines? Who can answer specific questions about the cell line's properties, behavior at later passage numbers, and identification?

Storage: Has a reserve of cells been created for each cell line? Do cell culture reagents, e.g., media and sera, meet your requirements for cGMP certification or testing for endotoxins, mycoplasma, and viruses? Is each cell line used with its own bottle of media? Does each scientist maintain a personal stock of reagents? When was the last time cells were tested for mycoplasma and cell identity authenticated?

Usage: Are antibiotics necessary? If so, which antibiotics are present in the media? If multiple antibiotics are used, is the cytotoxic concentration of that combination lower than when used independently? What is the confluency range required to maintain a viable culture? Have newly acquired cell lines been properly documented, including source and number of passages? After how many passages does your cell line exhibit different characteristics that may affect the integrity of your experiments? At what passage will your lab discard cells in culture and thaw a vial of stock? Do you test cell cultures for mycoplasma contamination weekly or monthly? Do you test the identity of the cell line at regular intervals or at key points in a project?

(Cited from http://www.genengnews.com/insight-and-intelligence/key-questions-for-cell-line-acquisition-storage-and-usage/77900102/)

Defenders against Death

One of the most important phenotypes in biology is cell death. One way to probe the mechanism(s) of cell death is to select molecules that prevent it and learn how this was accomplished. Here, intracellular combinatorial antibody libraries were used to select antibodies that protected cells from killing by rhinovirus infection. These rare antibodies functioned by inhibiting the virus-encoded protease that is necessary for viral maturation. Snapshots of the selection process after each round could be obtained by deep sequencing the ever-enriching populations. This detailed analysis of the enrichment process allowed an interesting look at a "test tube" selection process that pitted two replicating systems against each other. Thus, initially a minority of cells containing protective antibodies must compete against a majority of unprotected cells that continue to produce large amounts of virus.

(Cited from http://www.genengnews.com/insight-and-intelligence/defenders-against-death/77900097/)

Six Websites You Need to Bookmark: April Picks

① DNASU (https://dnasu.org/DNASU/Home.do)

The repository boasts an impressive collection of almost 200 000 plasmids, which include plasmids generated as part of large initiatives as well as those contributed by individual investigators.

② NEBioCalculator (http://nebiocalculator.neb.com/#!/)

The NEBioCalculator, an online tool from New England Biolabs, provides a simple web interface for scientists to access a number of calculators relevant to molecular biology experiments. These include four DNA calculators (ligation calculator and three unit conversion calculators for double-stranded DNA), two RNA calculators (mass-to-moles and moles-to-mass conversions), and three general calculators (concentration from optical density, dilution calculator, and molarity calculator).

③ Human Proteinpedia (http://www.humanproteinpedia.org/index_html)

Human Proteinpediais a nice website that allows the sharing of human protein data and annotations. Site visitors can register for an account if they would like to contribute data, although an account is not necessary if one simply wishes to access data from the site. All data can be freely downloaded.

④ Reactome (http://www.reactome.org/)

Reactome.org is an excellent database of "reactions" in biology. The Reactome website is beautifully designed and comes fully equipped with a comprehensive user guide, pathway browser (which in turn has its own user guide), and analysis tool for user-uploaded data.

⑤ Stem Cell Assays (http://stemcellassays.com/)

Stem Cell Assays is a great site for the latest stem cell news, as well as for articles and blog posts about techniques, protocols, and other related resources.

⑥ Retraction watch (http://retractionwatch.com/)

a website devoted to reporting the latest retractions. Posts are organized chronologically, with the most recent entries at the top of the page. Users can choose to browse posts by author, journal, country, type, and subject; however, the drop-down menu that allows one to do so is cumbersome to navigate.

(Cited from http://www.genengnews.com/insight-and-intelligence/six-websites-you-need-to-bookmark-april-picks/77900089/)