RESEARCH HIGHLIGHTS

Summaries of Medical Research of Interest

Michael Shusterman, Editor in Chief

Significant Discrepancies in Clinical Trials

Mathieu and colleagues report in a Journal of the American Medical Association study that the 2005 requirement that clinical trials be registered prior to publication in most medical journals has been widely flaunted by investigators. Of the 323 reviewed trials, 89 were not registered and 31% (46/147) of the properly registered trials showed discrepancies between registered and published outcomes. Furthermore, those trials with discrepancies favored statistically significant results. *JAMA*. 2009. 302(9): 977-984

European Drug Makers Ahead of the USA

Donald Light reexamines 1982 - 2003 chemical research data to find that European drug makers never fell behind US companies in production and innovation. Indeed many of the American innovations like Nexium™ and Lipitor™, cited as models of innovative discoveries, are either chemical imitators (Nexium™) or have not been proven to be any more effective than comparable compounds (Lipitor™). Light argues that pharmaceutical companies have produced imitators and incrementally useful drugs, instead of funding research for novel chemical compounds for clinical treatments. *Health Affairs*.2009. doi:10.1377/hlthaff.28.5.w969.

Vertebroplasty Not That Useful

Kallmes and colleagues show that a common procedure used to seal vertebral fractures with cement is no more effective in relieving pain than a placebo incision and injection with a rapidly acting analgesic. The treatment, known as vertebroplasty, costs between $2,500 - $3,000 and requires an additional $1,000 - $2,000 MRI scan. Currently significant regional discrepancies in use of the procedure exist, as noted by the accompanying editorial to the study. As with all evidence based medicine, the question is whether this work will lead doctors to change their behavior in the future. *NEJM*. 2009. 361:569-5

TuftScope Blog: Spread of Viruses Occurs Faster than Originally Thought

*Linda Le**

When it comes to viruses, the definition of 'living' and 'non-living' becomes a complicated issue. Some would argue that merely having a protein coat and genetic material does not qualify a living thing. However, when we look at virus' structural variety and incredible ability to replicate in a wide range of hosts, it is undeniable that they are indeed responding to their environment and evolving alongside other life forms.

Viruses have viral receptor proteins on their surface, which recognize specific host cells. They then insert their genetic material into the cell, and either create additional copies of their genome on their own (in the case of RNA viruses), or rely on the host cell's machinery (DNA viruses) for the same purpose. Of course, the host cell has its own ways of recognizing these foreign invaders. A method called RNA interference cuts off the production of viral mRNA, hindering the reproductive cycle. In humans, killer T-cells recognize viral fragments on the surface of an infected cell and mark it for apoptosis. Interestingly, the HIV virus undergoes rapid mutations that change the amino acid sequence on its viral coat, enabling it to escape both vaccines and the killer T-cell response.

Researchers at Imperial College London have recently captured a new video of the vaccinia virus spreading throughout cells over the course of 16 hours. The virus appears to spread at a faster rate than its replication cycle allows; it apparently has evolved a mechanism which allows it to recognize which host cells have and have not yet been infected, thereby saving time and effort. This new information could change the way we approach viral propagation, and hopefully, it will lead to more advanced medical strategies in treating viral diseases.

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