Did you know...?

History is filled with 'accidental' scientific breakthroughs... Sir Alexander Fleming discovering penicillin when mold contaminated his Petri dish... Edward Jennings noticing that milkmaids didn't get smallpox leading to the use of cowpox as a vaccine... Chris Polge's mislabeled glycerol bottle allows us to treat infertility through the freezing of sperm and embryos...

Even modern biomedical research is sometimes dependent on surprising discoveries and the imagination needed to put together seemingly unrelated ideas.

- **If you're taking ACE inhibitors to treat your high blood pressure, you're using a drug that was developed based on research investigating the venom of the deadly Brazilian pit viper.**
- **Post-World War II research on the impact of chemical warfare resulted in a treatment for fatal respiratory distress syndrome in premature infants, saving tens of thousands of babies in the U.S. each year from dying of suffocation.**
- **An anti-malarial drug, hydroxychloroquine (Plaquenil), is now used to treat the pain and inflammation of rheumatoid arthritis.**
- **A dramatic decrease in death and debilitation from heart attack and stroke is due to the development of clot busting drugs such as t-PA, which was discovered by scientists looking for a way to treat cancer.**
- **Thousands of Americans now take statin medications to lower cholesterol and reduce their risk of heart disease, but these drugs resulted from a convergence of research into a rare genetic disorder and the quest for a new antibiotic.**
- **Early scientific studies on how cancer cells grow led to acyclovir, the first major anti-viral drug, and AZT, part of the triple cocktail used to treat HIV / AIDS.**
- **The surprising discovery that bacteria cause stomach ulcers completely changed how physicians treated this painful condition.**
- **Scientists in search of a new contraceptive discovered tamoxifen, now used to treat and prevent breast cancer. In turn, while looking for similar treatments for breast cancer, researchers found raloxifene, a treatment for osteoporosis.**
- **One of the first anti-psychotic drugs, chlorpromazine, was first developed to prevent vomiting related to the anesthesia used in surgery.**
- **The findings of physicists, studying the effects of magnets on atomic particles, resulted in the invention of magnetic resonance imaging (MRI), used to diagnose and treat millions of patients worldwide.**

The next breakthrough is out there.

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The pathway that connects the scientist in the lab to the patient receiving medical treatment is often full of fortuitous discoveries and unpredictable twists and turns. Sometimes treatments arise from an unrelated area of medicine or science. Or an unanticipated discovery changes the way researchers look at the world and spawns new ideas for medical advancement. This can make it difficult to predict far in advance where the next breakthrough can occur. The examples here highlight the need for scientists to continue their quest to understand the fundamentals of basic biology and science in order to provide the tools we need to combat the devastating effects of illness, injury and disease.

"The unprepared mind can not see the outstretched hand of opportunity."

-Sir Alexander Fleming, discoverer of penicillin

FASEB

Office of Public Affairs
9650 Rockville Pike
Bethesda, Maryland 20814
Phone: 301-634-7650
Fax: 301-634-7651
Email: opa@faseb.org

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