

Nobel Prize Winners Spark Health Care Disruption

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Throughout history, strong macroeconomic forces, such as periods of slowing economic growth, have faced off against a seemingly silent but powerful competitor—human ingenuity and new innovation resulting from creative thinking. In many instances, innovation has won. Technologies that have fostered mining, steam power, affordable steel, electricity, the automobile and the internet have driven powerful secular growth resulting from the disruption of industries even when economic conditions have been challenging. Today, connected intelligence, which involves artificial intelligence and the internet of things, is a sizeable source of secular growth that is surging through the global economy, but other powerful forms of disruption are also common.

My last blog focused on how lithium-ion batteries developed by the winners of the Nobel Prize in Chemistry have supported wide-scale disruption and secular growth. In this blog, I discuss how Nobel Prize winners in Physiology or Medicine have had a dramatic impact on the pharmaceutical industry.

This year's Nobel Prize in Physiology or Medicine was awarded to William G. Kaelin Jr., Sir Peter J. Ratcliffe and Gregg L. Semenza for their discoveries into how genetic mechanisms regulate cells' responses to

changes in oxygen levels, such as variations that occur at different altitudes, and even how cancer cells compete for oxygen. In announcing the award, the Nobel Prize committee explained that labs and pharmaceutical companies worldwide are racing to use the researchers' work to develop drugs that could fight diseases by activating or blocking components of cells that sense oxygen levels. The research can potentially lay the groundwork for new drugs for fighting cancer, heart attacks, strokes and certain degenerative diseases. In doing so, the new drugs could potentially disrupt existing medical approaches for addressing those conditions.

At the same time, secular growth is accelerating through the pharmaceutical industry and cancer patients are benefiting from the commercialization of the pioneering work of James P. Allison and Tasuku Honjo, winners of last year's prize for research into immunology. Their work has resulted in the novel use of immunotherapy for fighting cancer. Unlike chemotherapy that kills cancer cells, immunotherapy enlists cells of the immune system to attack cancer. One category of immunotherapy drugs prevents cancer cells from shutting down the immune system. By doing so, the drugs engage T-cells to attack the cancer.

Immunotherapy is a formidable driver of secular growth. The category of drugs is only five years old, but its annual market size is expected to climb to \$44 billion by 2024. We believe innovative companies such as Merck & Co. and AstraZeneca that are disrupting the health care industry by providing immunotherapy drugs or developing new cancer treatments have strong potential for rewarding investors by continuing to grow their earnings.

Research into developing new immunotherapy drugs meanwhile is accelerating. In just one example, researchers are developing ways to engage a second type of T-cells, called helper T-cells, to assist with existing immunotherapy drugs.

On a much broader scale, [Nature.com](https://www.nature.com) reports that the Cancer Research Institute (CRI) has found that the number of active immunotherapy drugs in development globally grew from 2,030 two years ago to 3,876, a 91% increase, while the number of organizations, including academic and research groups, testing immunotherapy drugs increased 60%.

At Alger, we continue to believe that unprecedented levels of innovation are allowing leading companies to disrupt their industries and benefit from secular growth. This durable nature of innovation and secular growth, we believe, can endure throughout economic cycles and create attractive investment opportunities.

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Merck & Co. and AstraZeneca represented 0.05% and 0.03% of Alger assets under management as of 9/30/2019.

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