

Tumors defy Darwinian selection, new research shows

The GLP aggregated and excerpted this blog/article to reflect the diversity of news, opinion and analysis.

New answers may have just emerged in a long-standing debate in the field of oncology and molecular evolution. The neutral theory of molecular evolution states that changes occurring at the molecular level are not caused by natural selection, but rather by the random genetic drift of mutant alleles. In contrast, Darwinian selection adheres to the idea that a molecular mutation holds some selective advantage over the wild-type, allowing it to thrive.

When viewing these two theories through the lens of carcinogenesis, it is not difficult to envision the applicability of either theory. However now, new evidence from scientists at the University of Chicago and the Beijing Institute of Genomics may tip the scales in favor of neutral theory. This collaborative scientific effort assembled data from one of the most rigorous genetic sequencing ever carried out on a single tumor—revealing a much greater level of genetic diversity than expected.

The investigators excised a tumor roughly 3.5 centimeters in diameter (slightly smaller than a ping-pong ball), from a hepatocellular carcinoma tumor of the liver. The research team estimated that the tumor contained more than 100 million distinct mutations within genetic coding regions, which is thousands of times more than they anticipated. The impact of this finding is that even microscopic tumors are likely to contain extremely high genetic diversity and with so much variation there are likely many cells contained within able to resist standard post-surgical cancer treatment such as chemotherapy and radiation.

Read full, original post: [Darwinian Selection Does Not Influence Tumor Progression](#)