

The Two Faces of the “Pasteur Scientists” in Advanced Materials Field: Estimating their Contribution to Scientific Progress

by

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Abstract

This paper aims to identify the effect of industrial collaborations on scientific activities of universities and public research organizations active in the advanced materials field. Specifically, it considers which type of scientist is more likely to contribute to scientific progress as a result of industrial collaborations. According to the concept of Pasteur’s Quadrant (Stokes 1997), three types of scientists are identified: 1) “Edison scientists,” 2) “Pasteur scientists,” and 3) “Bohr scientists.” The first conduct pure applied research; the second never lose sight of the desire to advance scientific understanding, providing research with potential real-world utility; the third conduct pure basic research, oriented to the pursuit of knowledge and understanding for its own sake. In advanced materials the interaction between science and technology is particularly relevant, because it leads, on the one side, to the generation of new scientific knowledge, and, on the other, to the identification of industrial applications for scientific discoveries.

But does that interaction enable all scientists to exert the same impact on scientific progress?

The results of the estimation of a Poisson regression model applied to a sample of 66 scientists active in photocatalysis research in Japan confirms that “Pasteur scientists,” with a productive record of both publishing and patenting, contribute the most to scientific progress by publishing high quality papers, in terms of number of citations, when compared to other types of scientists.

Keywords: university-industry collaborations, advanced materials, scientific progress, “Pasteur scientists”, bibliometrics.