

Editorial

NBIC technology: The next step for research in Medical Sciences

What is NBIC?

NBIC is the newest concept in science. It has been introduced for less than 10 years. It is an actual convergence of science, a combination of four important novel sciences; nano-, bio-, info- and cogno-sciences. Indeed, each of the four components; nanotechnology, biotechnology, information technology and new technologies based on cognitive science, has already proved for its usefulness at present. Establishment of convergence across all fields of science and technology is the important practice at present (Martin-Sanchez et al., 2009; Bainbridge et al., 2006). The concept of convergence of science seems to be the effective tool in approaching a scientific question. For sure, NBIC can be well applied in biomedical science. Martin-Sanchez et al. recently performed a study to analyze the role that biomedical informatics could play in the application of the NBIC Converging Technologies and concluded that "particular attention should be placed on the ethical, legal, and social issues raised by the NBIC convergence (Martin-Sanchez et al., 2009). Gordijn proposed that the two steps for success in implement of NBIC included a) realizing the novelty of NBIC as the convergence of sciences and b) planning for the prospects of the NBIC projects (Gordijn et al., 2006). National Science Foundation concluded that NBIC will be the hope for enhancing human capabilities and serving human needs (Bainbridge et al. 2004).

How NBIC works?

The NBIC approach makes use of full functioning of the four basic new sciences. Its effectiveness is confirmed (Golledge et al. 2004; Canton et al., 2004) in medicine and biotechnology. The classical approach, can be the first line of approach to clarify the scientific problem. This can be fulfilled for the hard to discover area by using nanotechnology that helps answer the problem in the nano-area. After getting the information, information technology can help in the management of the data. Accompanied with cognotechnology, interpretation and implication of information to real usage can be finally gotten. In addition, the cross bridging between two sciences or more than two sciences is also possible. The good examples of those new hybrids include bioinformatics and nanoinformatics etc.

It can be seen that NBIC is useful in exploring the focused scope. It can further be used accompanied with novel synthetic biology (top-down and bottom-up) for understanding the life's principles (Bedua et al., 2010). However, there are also some points of NBIC to be considered. This seems to be the parts of NBIC that needs further solutions. The problem of the ethic for using NBIC should be raised (Khushf 2007a; 2007b). The regulation for further research on NBIC based on medical ethics is still required.

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