Professor Lee Insuk's Research Team

Finds a New Way to Study Human Diseases

Like a social network service such as Facebook and Twitter, genes working in human bodies are functionally wired for cooperation. Prof. Lee's research team has previously developed one of the world's largest networks of human genes, dubbed "HumanNet" (www.functionalnet.org/humannet), which connects more than 16,000 human genes with a half million cooperative relationships (see the figure below). To develop this network, his team used Big Data mining approaches, analyzing more than 50 million data points about biological molecules. This network has proven useful in various human disease studies such as discovery of disease genes and classification of cancer patients.

More recently, his team demonstrated that HumanNet can find nonobvious connections between human disease systems and laboratory organism phenotypes. Laboratory organisms are indispensable for human disease research, because they have many disease systems evolutionally conserved. However, finding disease systems from laboratory organism is often prohibitively difficult due to their seemingly unrelated phenotypes. To overcome this hurdle, his team developed a new HumanNet-based software, MORPHIN (model organisms projected on a human integrated gene network; http://www.inetbio.org/morphin), to find hidden disease systems from various laboratory organisms such as yeast, worm, fly, fish, frog, mouse, and rat. For example, using MORPHIN, his team found that worm genes regulating 'fat associated bodies' are associated with human disease 'hyperhomocysteinemia.' This connection between worm phenotype and human disease was not detectable by any previous methods. This finding was also validated by independently reported clinical implication of association between hyperhomosysteinemia and Type 2 diabetes.

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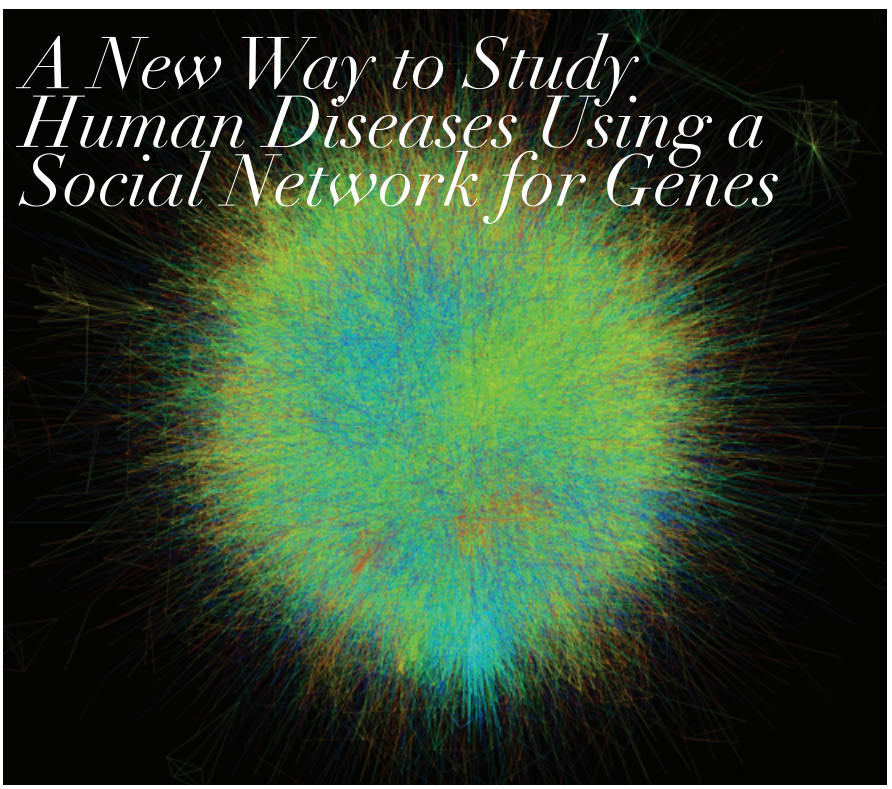

IMAGE: HumanNet

Yonsei Center for Research Facilities

In the era of globalization, the requirements of the facilities for preoccupy the advantageous position in academic research areas are more and more increased. In other words, the facilities and analysis equipment should be provided to achieve a high level of researches. In order to jump up to be a world-class educational · research institution beyond the nation's premier facilities, Yonsei Center for Research Facilities (YCRF) has supported the activation of research and the improvement of facilities in the innovation process of university.

YCRF which retain 50 kinds of the facilities and analysis equipment worth more than 10 billion won is an institution for bio, inorganic, organic, and surface analysis. Experts in the center can provide advanced material analysis for enhancement of research support and cooperation between industry and school.

YCRF expects that the designation as Korea Laboratory Accreditation Scheme (KOLAS) by Korea Agency for Technology and Standards will significantly expand analytical capabilities to become a leading center of the world. In this respect, the facilities in YCRF are retained consistently for the purpose of construction of the research infra that offers the most advanced scientific technology research. Moreover, YCRF also have been hold workshops for specific/whole equipments and run the tour through the center.

Based on these total active supports, YCRF possesses capability for the high level of analytical techniques and education especially on the most advanced scientific technology research.

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