BioSpectrum the business of Bio & Health Sciences ASIA EDITION

SBV IMPROVER methodology could in theory be applied to any disease area'

November 13, 2015 | Opinion | By BioSpectrum Bureau

SBV IMPROVER methodology could in theory be applied to any disease area'



SBV IMPROVER project, a crowd-sourcing and collaborative competition for scientific research are new approaches to bring scientists' communities together for a common goal. How did this model evolve and what difference can it make in drug discovery?

The growth of crowd-sourcing and collaborative competition in scientific research has been driven by the desire to ensure credibility, impartiality and the reproducibility of conclusions. There are now many community-based scientific projects, of which SBV IMPROVER is just one 1,2. Others include CASP (Critical Assessment of Protein Structure Prediction), DREAM (Dialogue for Reverse Engineering Assessments and Methods) and BioCreAtIvE (Critical Assessment of Information Extraction Systems in Biology)3-5. Common to all are two underlying principles:

Ã?Â¯Ã¢â??Â¬Ã?Â Assessment of a prediction by an impartial, outside party is a more rigorous model for verification than self-assessment

Ã?Â¯Ã¢â??Â¬Ã?Â Responses of the community to a prediction challenge can build consensus in the community regarding the most constructive methods for the task

In terms of drug discovery, the applications of crowd-souring and collaborative competition are many. In the case of SBV IMPROVER, our first challenge - the Diagnostic Signature Challenge - invited participants to identify new biomarkers across four distinct disease areas, many of which have the potential to be targets for new therapeutic interventions.

Our most recent challenge meanwhile - the Network Verification Challenge - seeks to build comprehensive models of biological networks that are relevant to respiratory disease. It is hoped that these models will assist in the identification of clinical relevant biomarkers of disease and provide a framework within which the mechanistic action of new drug compounds can be tested.

What is the role of scientists in Asia in SBV IMPROVER project? How can they contribute in and benefit from this project?

SBV IMPROVER is a global initiative which is relevant to scientists in all geographies. Our latest challenge attracted participants from 26 countries. We are present at International Conference on Systems Biology in Singapore (23-26 November) which is a gateway to meet more scientists from Asia.
The benefits of participation in SBV IMPROVER are many, but they include peer-recognition, publication opportunities and engagement with leading systems biology experts from around the world. To take part in an SBV IMPROVER challenge is to be part of a pioneering community that is driving innovation and working together to improve how scientific research is conducted and verified.

What is the funding model of the SBV IMPROVER project?

SBV IMPROVER is a collaborative effort led and funded by Philip Morris International (PMI) Research and Development. The development of the initiative is itself a major challenge which requires the participation of many experts from academia, industry and other interested fields. Importantly, as the SBV IMPROVER crowd continues to grow, the scientific value of the project also increases.

What are the disease areas that the project is focusing on?

Different SBV IMPROVER challenges have focussed on different disease area. The Diagnostic Signature Challenge focussed on psoriasis, multiple sclerosis, chronic obstructive pulmonary disease and lung cancer. The Network Verification Challenge is focussing on biological networks that are relevant to respiratory disease, although some of these networks also play a role in other diseases.

The SBV IMPROVER methodology could in theory be applied to any disease area, in fact any scientific area that requires a more meaningful analysis of data.

How can the outcomes of the challenges be incorporated into global drug research programs?

Challenge participants are often attracted to SBV IMPROVER in order to apply the project's methodologies and findings to their own specialist areas. This is happening in fields as diverse as arthritis, renal disease and pregnancy. The output of the Network Verification Challenge has further been used as an input to the BioCreAtIvE challenge5, which is designed to evaluate text-mining and information extraction systems applied to the biological domain. For PMI, it is hoped that the networks being produced in the Network Verification Challenge will provide a valuable tool in the assessment of an innovative portfolio of reduced-risk alternatives to conventional cigarettes for adult smokers.

What should be the approach of scientists and pharmaceutical companies to enhance drug discovery and bring new drugs in the pipeline?

The potential of systems biology to enhance and expedite the drug discovery and development process is highly significant. We hope that through initiatives like SBV IMPROVER the scientific community will continue to learn about systems biology and begin to use some of the techniques we are exploring to refine Research and Development, particularly in pre-clinical and safety toxicology.