New genome profiling technique identifies weak points in breast cancer cells

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New research published in *Cancer Discovery*, the newest journal of the *American Association for Cancer Research*, details a large-scale project in genetic profiling that has identified many of the weak points in breast tumor cells.

Alan Ashworth, Ph.D., chief executive officer of the Institute of Cancer Research in London, said the quest for a more personalized approach in cancer treatment has driven him and his colleagues to identify those genes upon which breast tumor cells are completely dependent. Ashworth and his colleague Christopher Lord, Ph.D., see this project as the first step toward the development of better treatments for the disease.

“We’ve already had significant success in identifying some of the genes that are highly active in breast cancer and then blocking them, such as HER2. Our new work shows there are many other ways of doing this by using some of the inherent weaknesses found in breast cancer cells,” said Ashworth.

José Baselga, M.D., Ph.D., co-editor-in-chief of Cancer Discovery and chief of hematology/oncology at the Massachusetts General Hospital, moderated a teleconference on this research.

In addition to Baselga, the following panelists participated in this AACR-hosted teleconference:

- Alan Ashworth, Ph.D., chief executive officer of the Institute of Cancer Research in London;
- Christopher Lord, Ph.D., senior staff scientist at Breakthrough Breast Cancer Research Center at the Institute of Cancer Research in London; and
- René Bernards, Ph.D., professor of molecular carcinogenesis at The Netherlands Cancer Institute in Amsterdam.

Ashworth and Lord performed high-throughput RNA interference screening in more than 30 commonly used models of breast cancer to identify a series of genes upon which breast cancer cells rely. This method identified potential therapeutic targets for PTEN-mutated cancers and for ER-positive breast cancers.

“We showed that large-scale functional profiling allows the classification of breast cancers into subgroups distinct from the established subtypes,” said Ashworth.

According to Lord, this work is the starting point for the development of new drugs for the disease. “We want to refine each patient’s treatment according to the specific type of disease they have. To do this we first need to know where the weaknesses are in breast cancer cells and to then develop drugs that hit these weak spots. With this new information we can start to do that,” said Lord.

Ashworth is a principal on the Stand Up To Cancer Breast Cancer Subtypes Dream Team.

“Stand Up To Cancer has provided funding that is vitally important, and through the Dream Team framework they also provided the collaborative structure that was necessary for our research,” said Ashworth. “The ability to collaborate with other team members and share genetic data has been vital and will continue to be necessary as we

apply this finding to other cancer tumor types."

Provided by American Association for Cancer Research