

Unravelling genetic factors underlying cancer cell adaptation - a foundation for developing cancer therapies

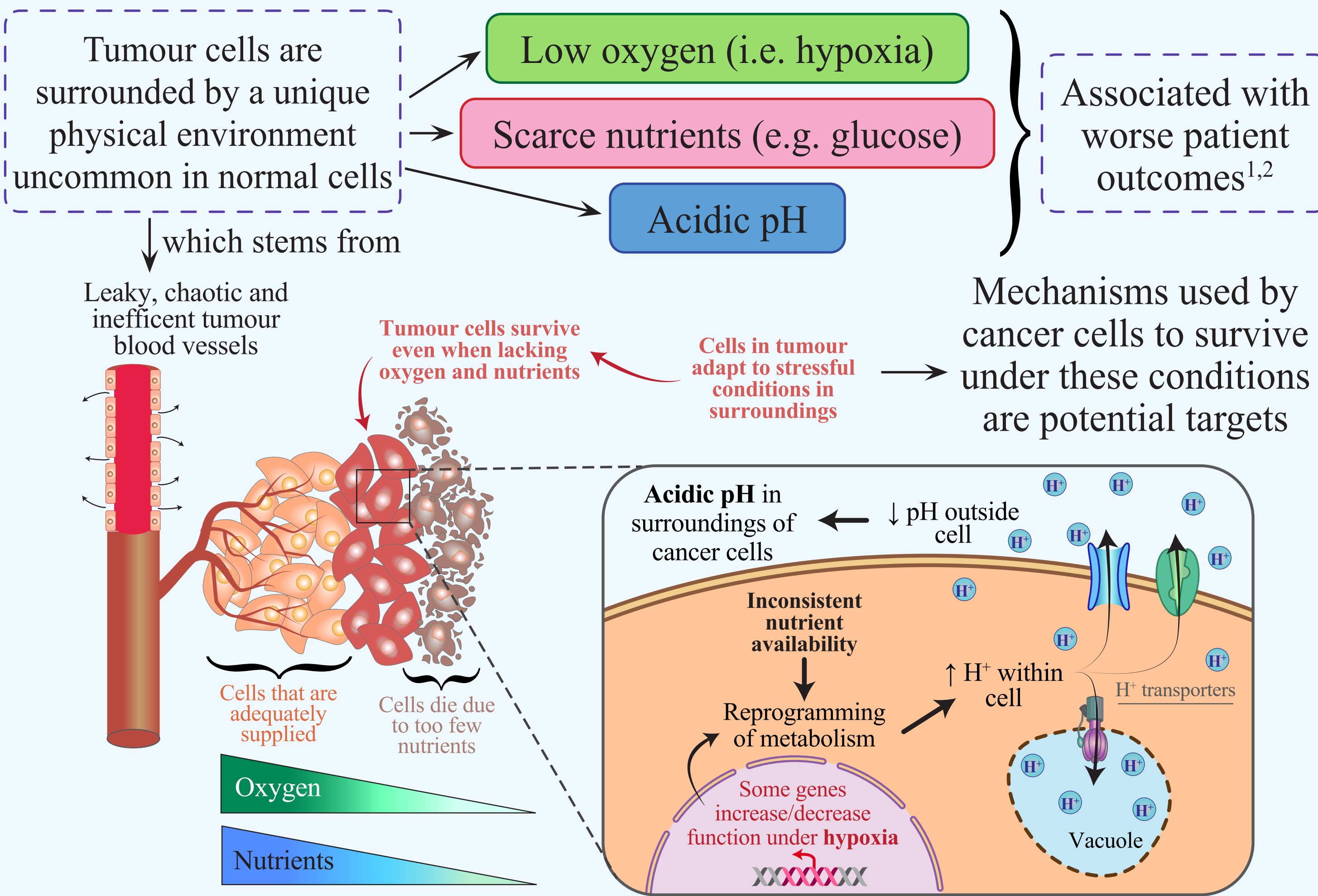
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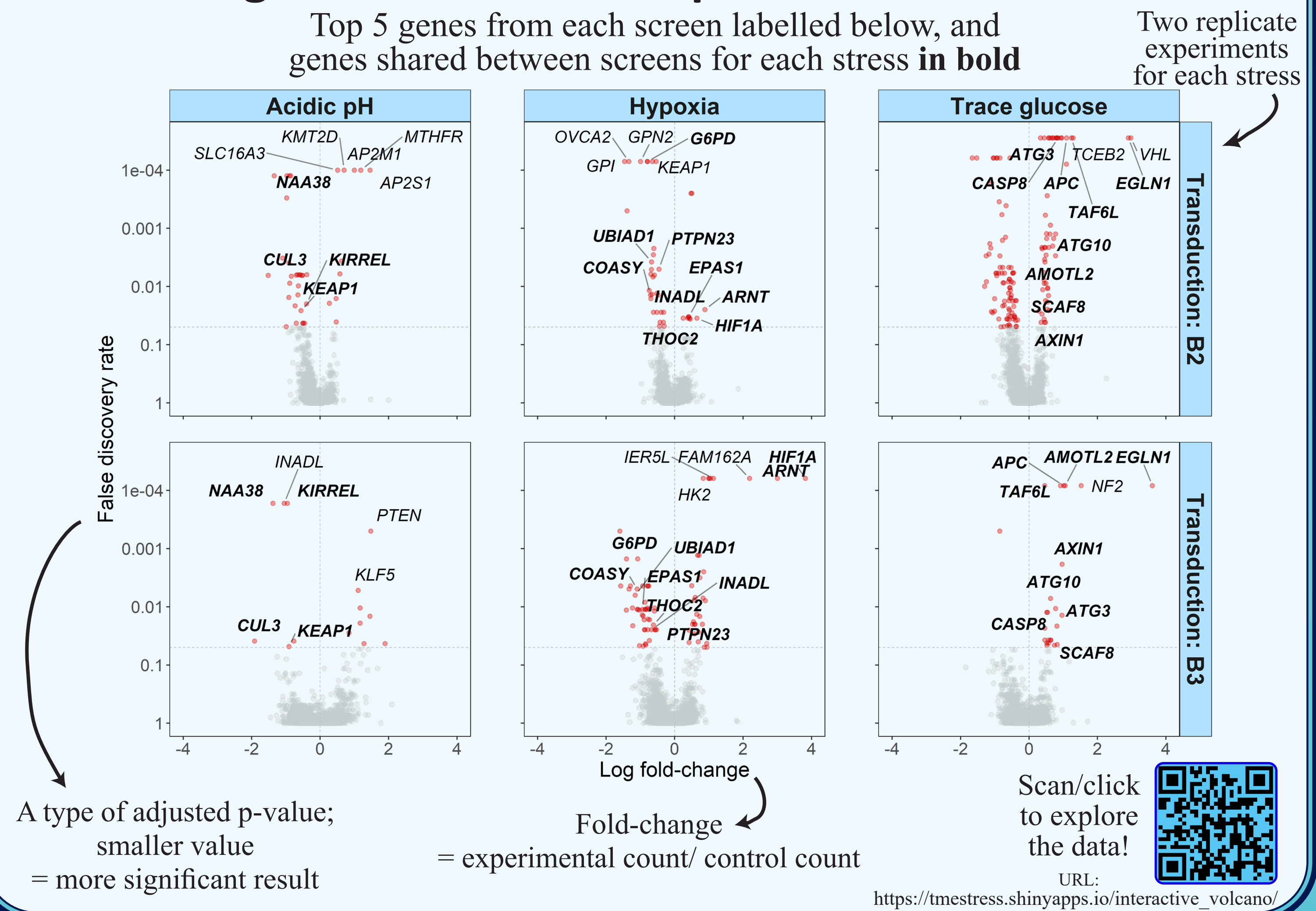
Main questions

- ✓ Which genes are important for cancer cell adaptations?
- ✓ How can these results be used to benefit cancer patients?

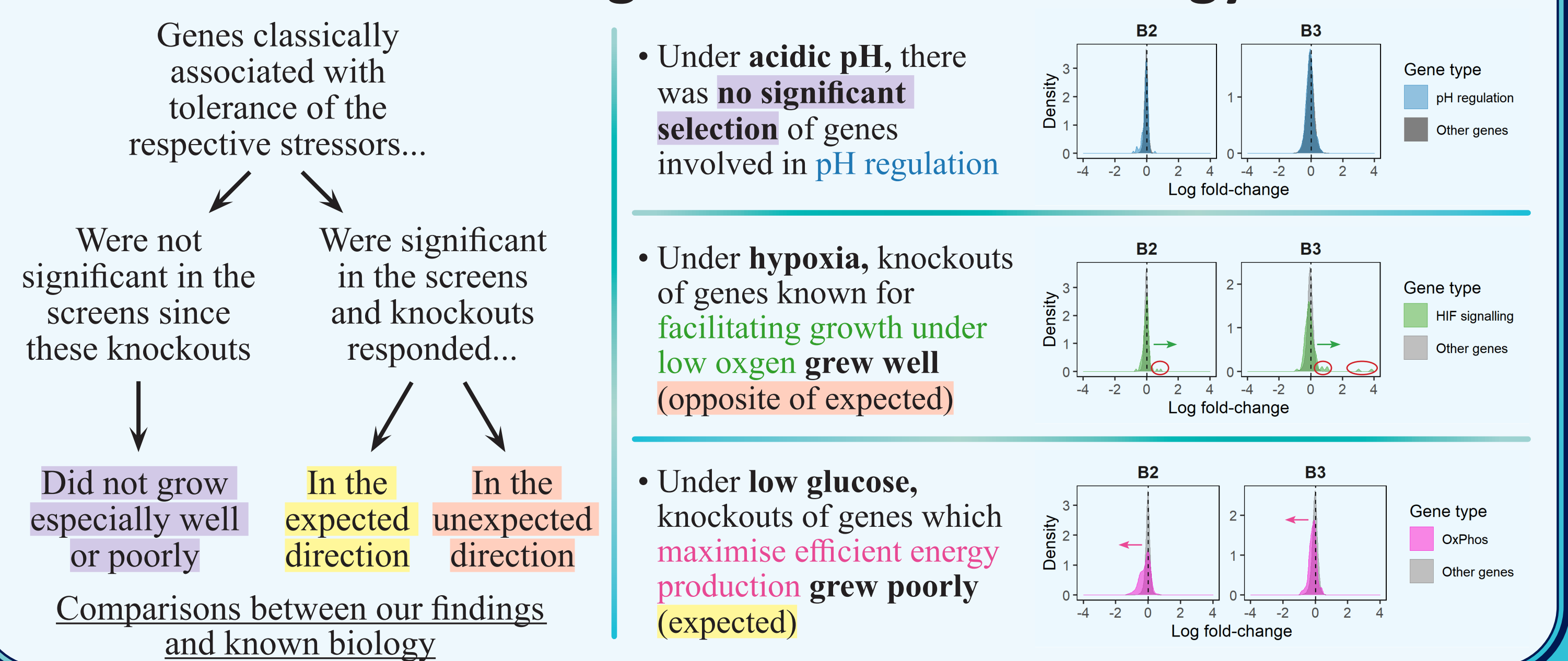
How can we target cancer cells specifically?



Which genes were most important in the screens?



Do the findings match known biology?



What method can be used to find the genes that enable cancer cells to survive in these unique conditions?

Test how disrupting (i.e. knocking out) each gene affects cancer cell survival

Thousands of genes exist, so testing one gene at a time will take too long

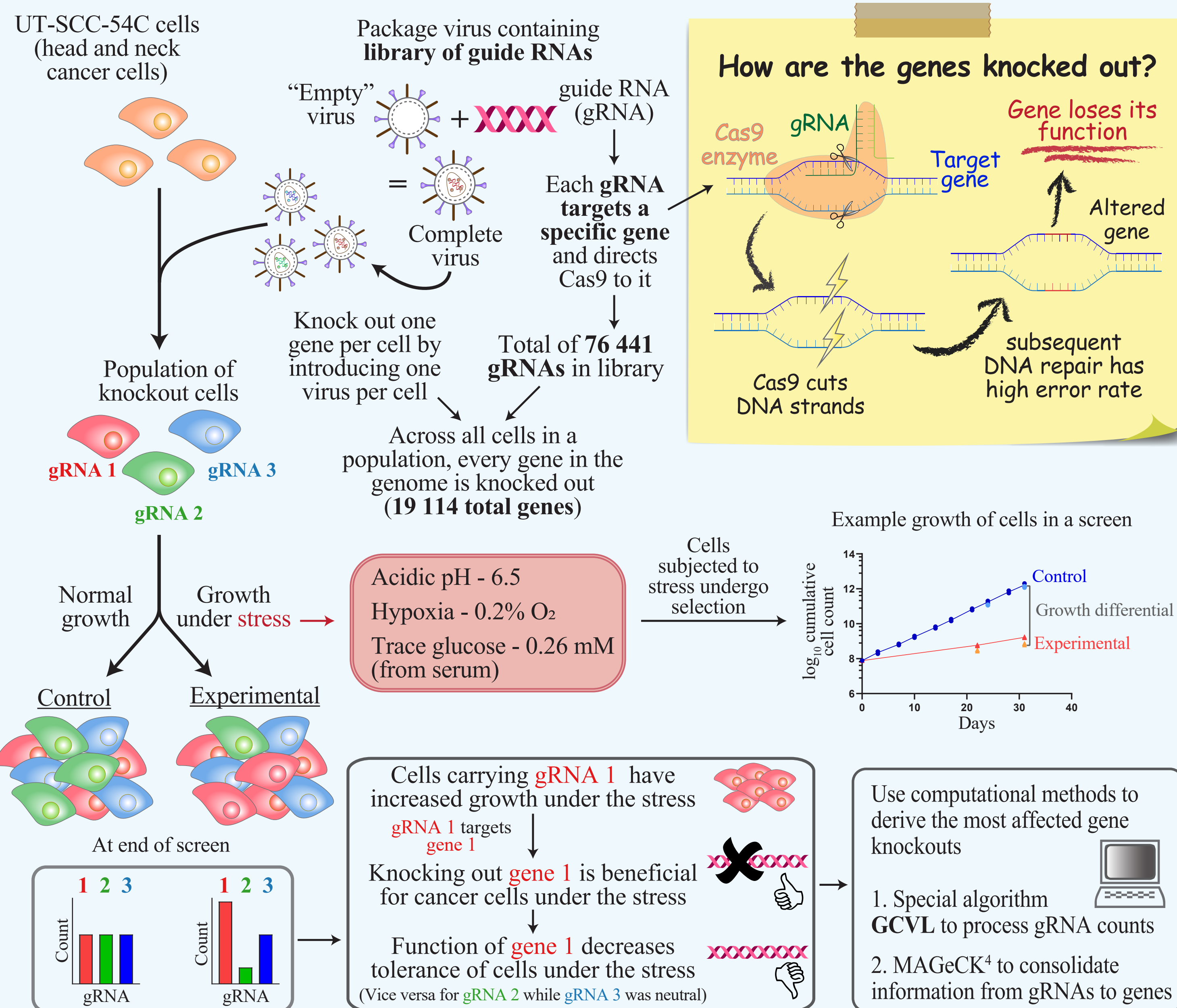
Instead we can do so for all genes across the genome in parallel using **genomic knockout screens**³

Why is this knowledge useful?

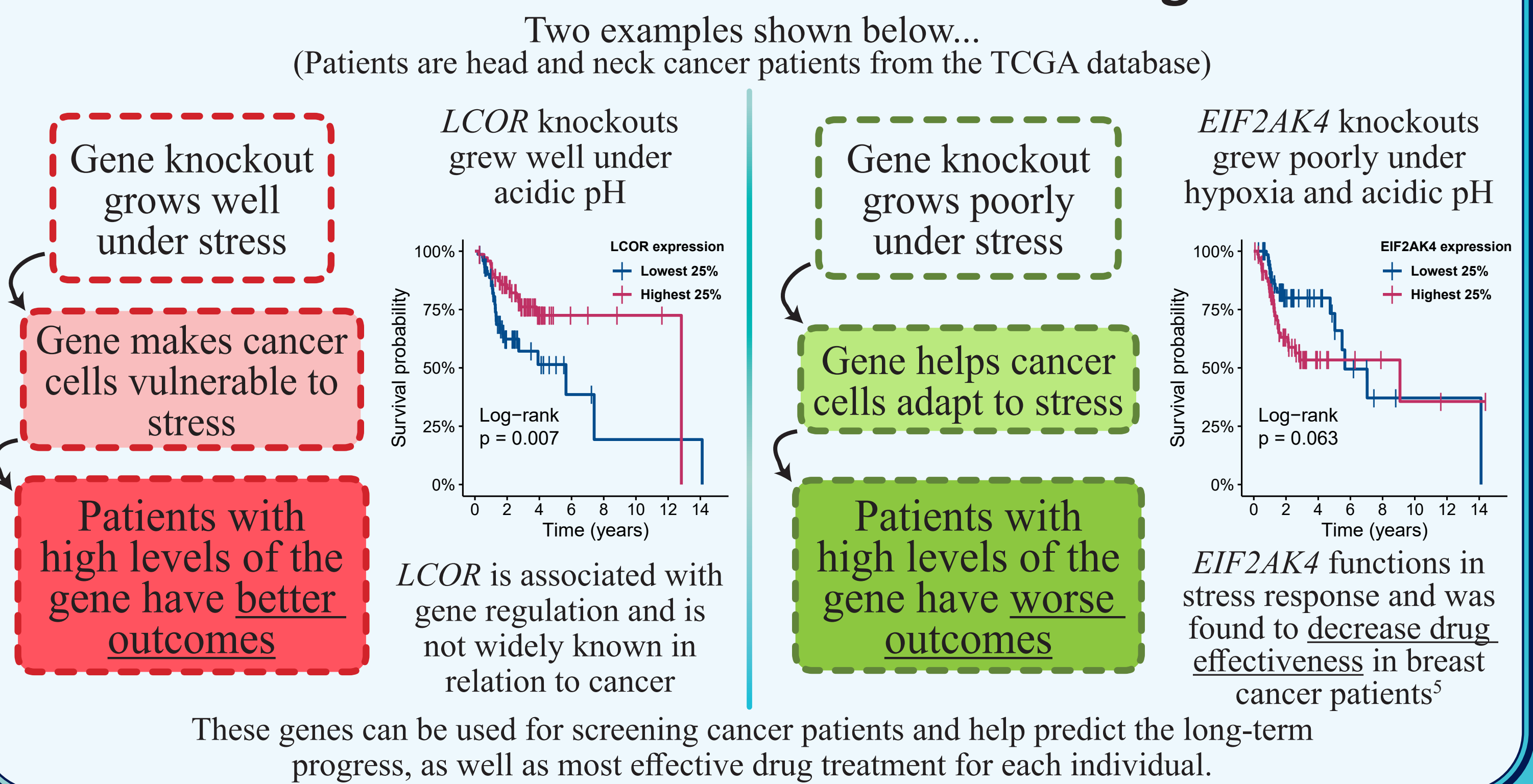
By identifying the genes that are essential for cancer development, we can potentially

- ✓ Improve our knowledge of the biology underlying this stress
- ✓ Develop new anti-cancer drugs
- ✓ Use them for genetic screens to match cancer drugs to cancer patients

What steps are involved in a genomic knockout screen?



What real-world relevance do the findings have?



Overall takeaways

- Our genomic knockout screens successfully identified genes required by cancer cells to adapt to their stressful surroundings
- ✓ Many gene knockouts significantly affected cancer cell survival under stress - further study into these genes may lead to future cancer therapies
 - ✓ Some findings are not consistent with the biology that is currently known, constant ongoing research is thus important
 - ✓ Several genes were associated with difference in survival and treatment response of cancer patients, and may be useful for applications in the clinic

References

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